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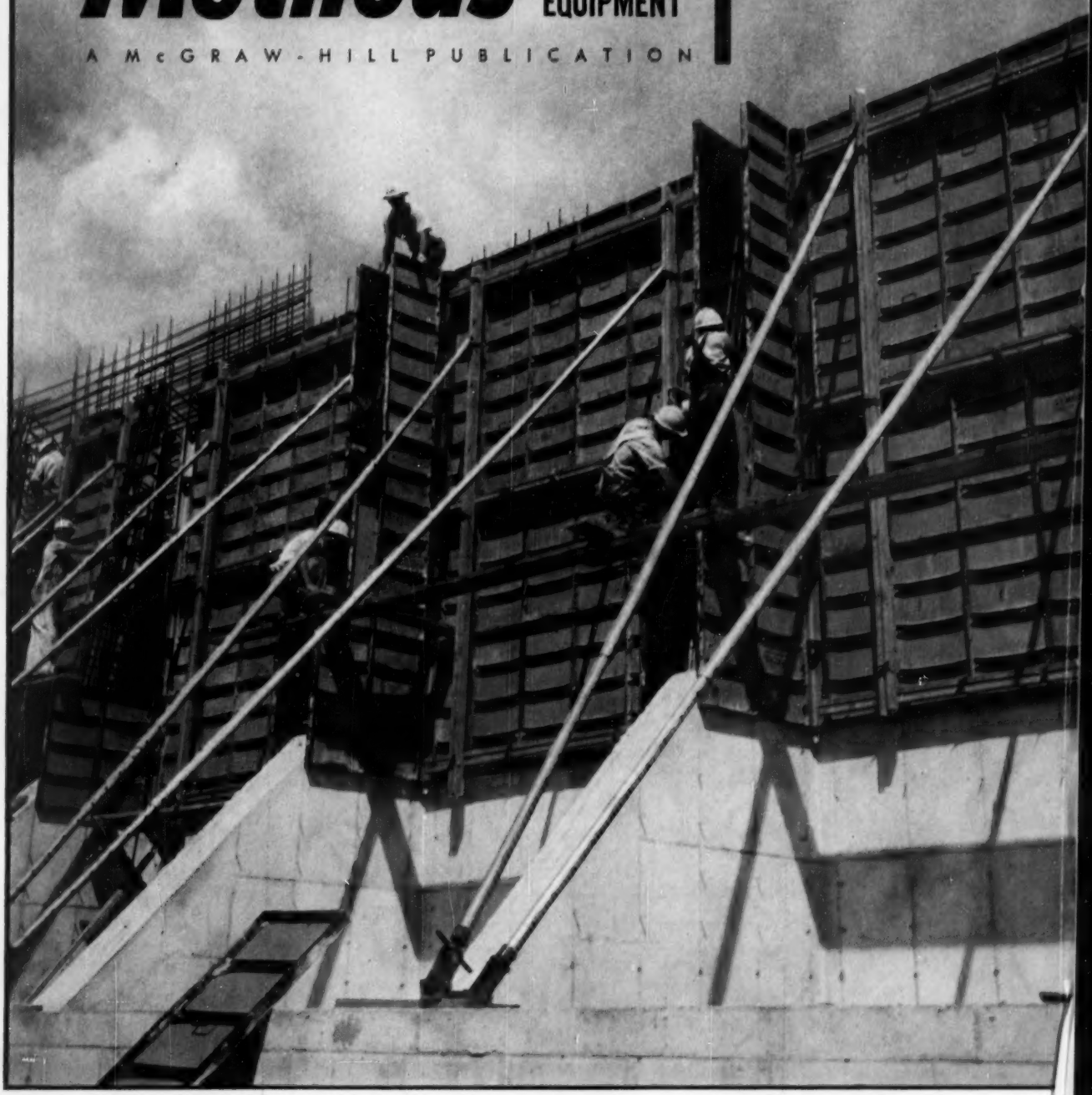
Construction Methods AND EQUIPMENT

A McGRAW-HILL PUBLICATION

DECEMBER, 1956



At Air Force Academy, aluminum braces hold steel-frame plywood panel forms for counterfort wall . . . p. 2

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Two of Motor Crane Service Co.'s cranes team up to lift a 28-ton machine to the second floor of a Denver, Colorado, factory.
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B. F. Goodrich conveyor belt doubles production, cuts costs 40%

Nyfil fabrics give belts greater strength, yet cost no more

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Construction Methods AND EQUIPMENT

VOLUME 38

NUMBER 12

ESTABLISHED 1919

December, 1956

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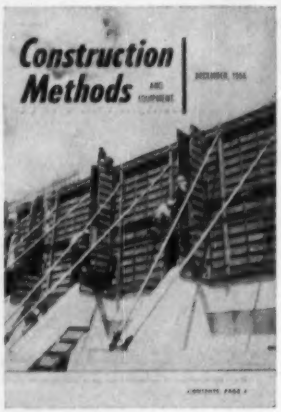

On the Cover

Workmen button-up Symons Steel-Ply panel forms for heavy retaining wall at new Air Force Academy near Colorado Springs. Denver's Long Construction Co. devised telescopic aluminum pipe braces to help hold forms in place. A complete story about Long's ingenious operations in building 10,000 lin ft of these high walls begins on page 56.

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Editorial, Executive and Advertising offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Donald C. McGraw, President; Paul Montgomery, Executive Vice-President; Joseph A. Gerardi, Executive Vice-President and Treasurer; Hugh J. Kelly, Executive Vice President; John J. Cooke, Secretary; Nelson Bond, Executive Vice-President, Publications Division; Ralph B. Smith, Vice-President and Editorial Director; Joseph H. Allen, Vice-President and Director of Advertising Sales; J. E. Blackburn, Jr., Vice-President and Circulation Director.

Subscriptions: Address correspondence to Construction Methods and Equipment—Subscription Service, 330 W. 42nd St., New York 36, N. Y. Allow ten days for change of address. Subscriptions are solicited only from persons engaged in construction or in supplying the construction industry. Position and company connection must be indicated on subscription orders.

Single copies 50¢. Subscription rates—United States and possessions $3.00 a year; $4.00 for two years; $5.00 for three years. Canada $4.00 a year; $6.00 for two years; $8.00 for three years. Other Western Hemisphere and the Philippines $10.00 a year; $16.00 for two years; $20.00 for three years. All other countries $15.00 a year; $25.00 for two years; $30.00 for three years. Second class mail privileges authorized at New York, N. Y. Printed in U.S.A.

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December, 1956

Pay Dirt in This Issue

New Ways With Wall Pours 56
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Next Month

Roadbuilding is an ancient but increasingly important arm of the construction industry. To prove it, manufacturers, distributors, and contractors from all over the country will converge in Chicago from Jan. 28 to Feb. 2 for the American Road Builders' Association's 1957 Road Show. It will be the first one held since 1948. Construction Methods editors will signalize this event next month with a special issue devoted to roadbuilding. It will be chock full of important data on new developments in roadbuilding equipment and techniques. Look for it. It's an issue you won't want to miss.

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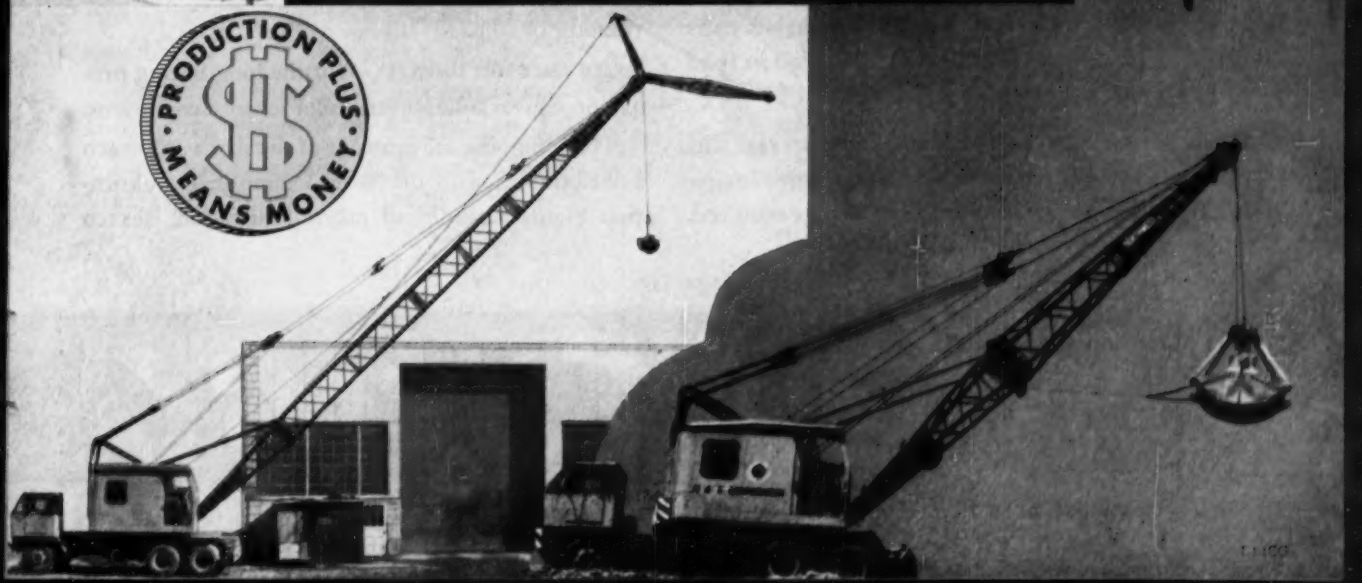

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U. S. Army, Corps of Engineers photo

FOLSOM DAM on American River near Folsom, California. Merritt-Chapman & Scott Corporation and The Savin Construction Corporation, contractors for main dam *(shown)*, credit Texaco Lubricants and Lubrication Engineering Service with a big assist in keeping construction equipment working dependably and maintenance costs low.

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Typical of today's modern highway construction is this view of the new Freeway in Oakland, Calif., showing 3 levels of highway structure over 2 levels of railroad. *(Photo courtesy California Division of Highways)*

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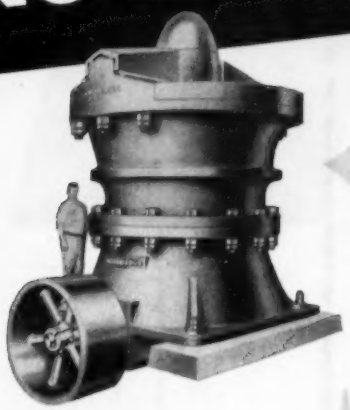

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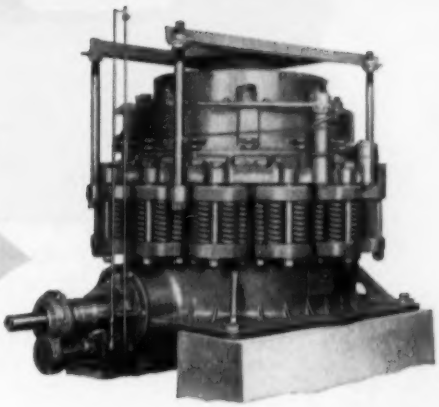

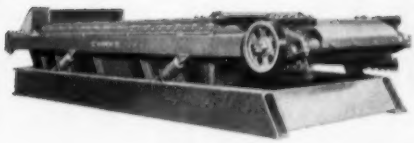

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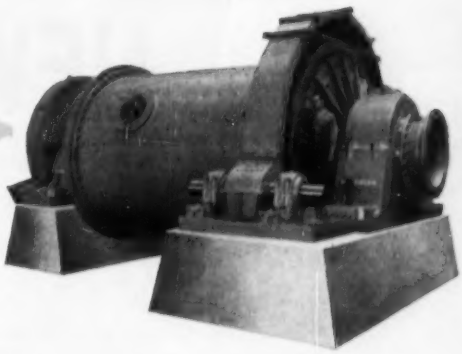

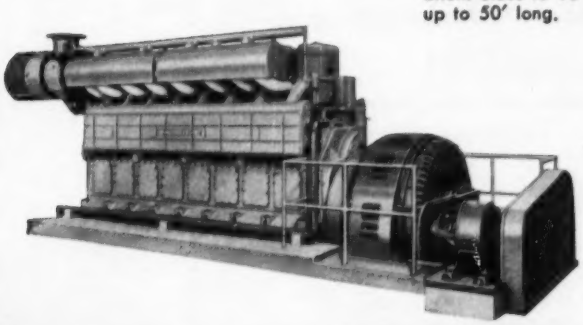

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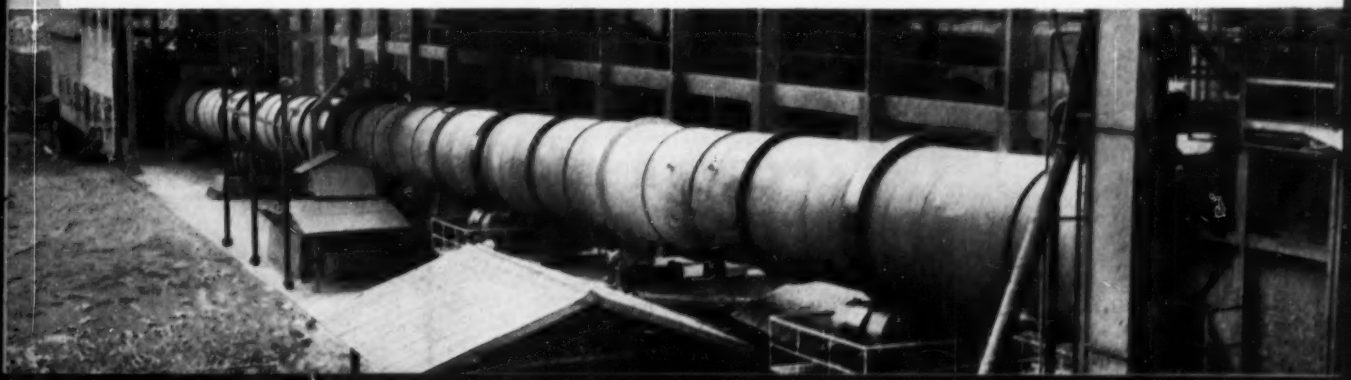

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Construction News From Washington

Washington, D.C.
December, 1956

Lease Purchase Out?

The $700 million lease-purchase program may be on the way out. Key administration officials—including those who favored it from the beginning—are having second thoughts about the effectiveness of this method of getting needed Federal buildings constructed.

Purpose of the program was to keep Federal spending down by drawing on private investment funds. While the buildings ultimately would cost the Federal government more (because of interest payments over 10 to 25 years), the annual addition to the Federal budget would be small compared to the outlay if the buildings were paid for cash-on-the-line as they were built.

Trouble is that the program has had difficulty getting off the ground. Though it has been under way for two years, so far, General Services Administration and the Post Office Dept. have only one building under construction.

Result is the huge backlog of Federal buildings is in danger of becoming blocked at the crucial point: Investors just aren't bidding on the lease-purchase kind of deal.

Next test should come this month when six bids are to be opened under the just-announced revision of GSA rules: Only combination financing-construction bids will be accepted. This should show whether the program can be carried forward with a 4% interest rate ceiling under today's conditions.

Missile Plant Spending Goes Up

Air Force contractors may be spending more than $300 million on new plants for missile production over the next few years. The plants are needed because of the swift increase in missile procurement—estimated to multiply by four in the next four years—plus the fact that existing aircraft plants are not suitable for missile production.

Companies like Martin and Boeing are already commited to missile factories away from their existing plane-making installations. One of the factors is the need for location that (a) Will attract engineers and (b) Will permit relative ease of testing.

No Union-Contractor Deal

Chances for agreement between contractors and the building trades unions on substantial changes in the Taft-Hartley Act are still almost nil. That's the outcome of meetings in Washington with Secretary of Labor Mitchell sitting in as moderator.

Contractors aren't of a mind to back those union-sought changes

supported by the Eisenhower administration: Easing the ban on secondary boycotts so construction workers can strike entire projects, permitting "pre-hire" agreements between contractor and union, and a seven-day union shop waiting period.

Cement Wins Out

The Air Force has won its right to use portland cement in preference to asphalt paved air bases. The Asphalt Institute, downed in recent tests, is cooperating now with the Army Engineers Pavement Lab. to mix a new batch that can get them back into the running.

Result of a competitive test at Kelly Air Force Base this summer —set up by the Army Engineers for the Air Force at the request of the asphalt interests—was a smashing success for concrete. Asphalt officials admit that, as things now stand, they have no argument with which to persuade the military to accept bituminous pavement for airfields on runways, taxiways, and other airfield pavements.

The test compared the two types of pavement under simulated repeated loadings of heavy aircraft—a load of 100,000 lb. Both were built to military specifications.

Test procedure called for 30,000 round-trip tandem-rig load repetitions of dual-wheel landing gear. The asphalt strip began to show distress at about 3,000 coverages (12,000 single-axle load applications) and became so badly rutted at 9,000 round trips that the testing of the asphalt pavement was discontinued. However, at the end of 30,000 round trips on the concrete pavement, it showed no signs of deterioration.

Blacklisting Up

Davis-Bacon blacklist of contractors has skyrocketed under the GOP, Secretary of Labor Mitchell tells building trades members. He reports that under the Davis-Bacon Act, 114 contractors have been blacklisted since Eisenhower took office—which he compared to only "four in the 17-year period" before Eisenhower came in. A contractor found violating wage and working conditions specified under the law may be barred from government jobs for a period of three years.

Highway Spending

Construction under the new highway program won't soak up the funds available even in the second year of the program. Federal payments to the states will amount to about 60% of allocations for the year beginning next July 1, according to estimates presented to the Budget Bureau.

Federal money paid out to the states will run about $1.5 billion, whereas the allocation for the same year to all Federal-aid programs comes to $2.55 billion. Of the $1.7 billion allocated to the interstate network, it's estimated that about $750 million actually will be paid out. Another $750 million in grants will go to other Federal aid highways.

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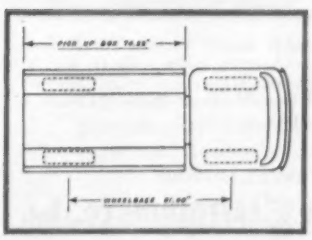

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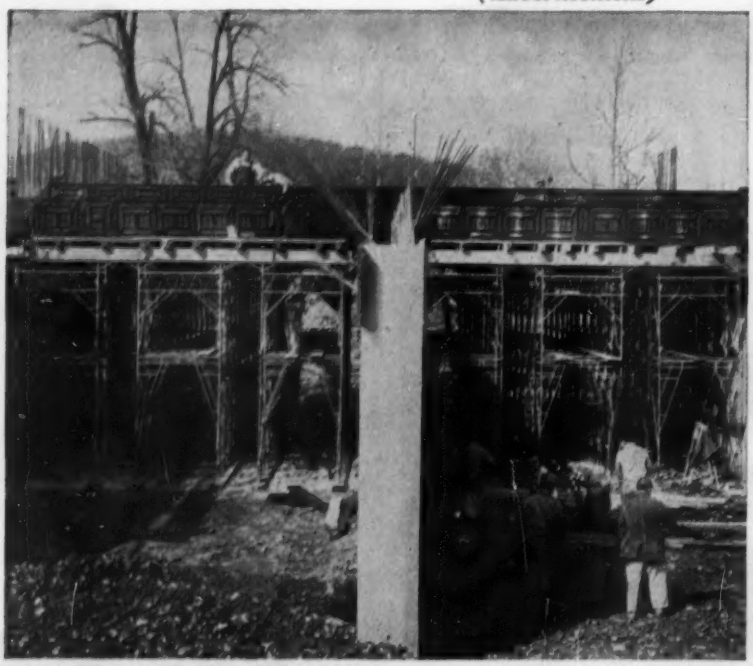
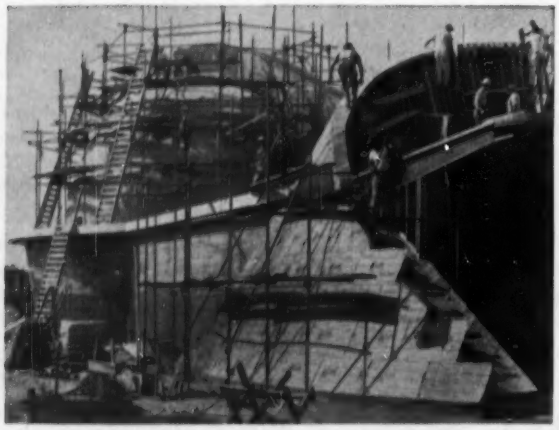


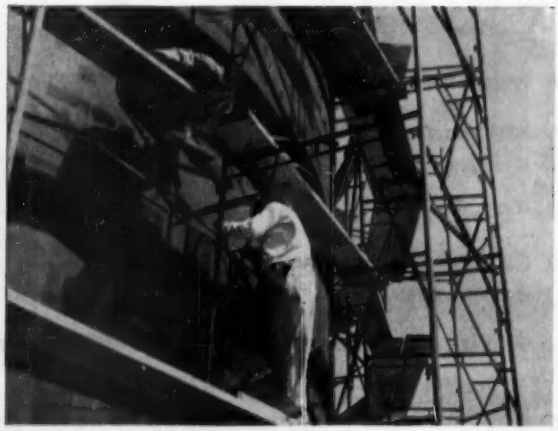
BRIDGE SHORING CUT 25% — Modern "Trouble Saver" ® Steel Shoring helps contractor, Mal-Bros., save 25% in shoring costs, over wood methods, on a street relocation job in Scotch Plains, N.J. 272 frames with patented SlideLoks, quickly assembled in 3' x 5' towers and 2'6" between rows, provide support for the new roadbed. The contractor says his savings would have been 50% if the job were bigger.

LEVELING OFF — Masons for contractor John B. Kelly easily check level from safe, stable 28" wide "Gold Medal" ® Twin Drum Scaffolds on the new 14-story Virginia State Office Bldg., Richmond.

Scaffolding Methods . . . by Patent Scaffolding Co.



ALL SURFACES — Plasterers for Travis and Rodgers, contractor, get everywhere quickly on these 40' by 36'-high odd-shaped domes from 2½ miles of "TubeLox" ® Scaffolding. Cantilevering prevents the scaffolding from bearing at any point on this building in Disneyland near Los Angeles.



REFINERY JOB — "Trouble Saver" Sectional Steel Scaffolding is easily assembled to conform to round surfaces, such as this oil storage tank at the huge new Tidewater Oil Co. Delaware Flying-A Refinery near Wilmington. Workmen for C. F. Braun & Co., builder, are insulating the tank's exterior.

To help you with your scaffolding methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that sells and rents "Gold Medal" Scaffolds.

FOR GREATER SAFETY...EFFICIENCY...ECONOMY

THE PATENT SCAFFOLDING CO., Inc.

38-21 12th Street Dept. CM&E Long Island City 1, N. Y.
West Coast: 6931 Stanford Ave., Los Angeles 1, Calif.
Branches in all principal cities
In Canada: 355 Dufferin St., Toronto

It's Performance That Counts In Products and Service!

Phillips *66* heavy duty motor oils, greases and gear oils give protection to your equipment against dust, mud and heat. And with Phillips *66* Diesel Fuels your equipment will have the power to put out its rated payload.

You'll get complete service—Phillips *66 individual* service. A Phillips *66* lubrication engineer will consult with you right on the job. He will make recommendations for the *right* fuels and lubricants, and will help you set up a storage and service area for the operation.

For full details, write: Sales Department, Phillips Petroleum Company, Bartlesville, Oklahoma.

Phillips 66 fuels, heavy duty motor oils, greases and gear oils meet manufacturers' specifications. Cut maintenance costs and down-time. Switch to Phillips 66 products now.

Phillips 66

It's Performance That Counts!

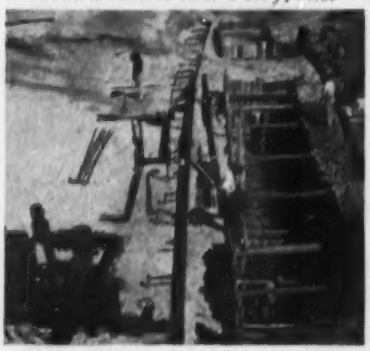
PHILLIPS 66 HEAVY DUTY MOTOR OILS

HOW TO HANDLE
WET JOBS

NEW SEA LIFE HOME
FOR MARINE STUDIOS

Marineland, Fla.

Contractor: Arthur Perry, Inc.



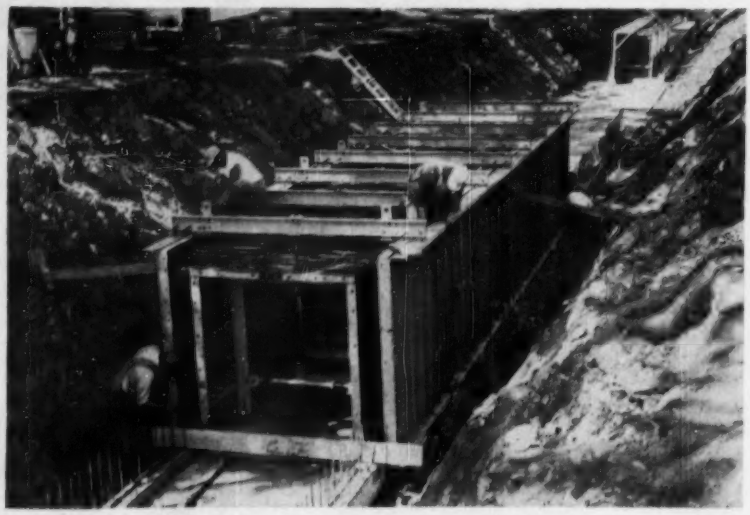
50 POINTS, 240-ft header: What volume could be handled by a well-point system of such size, working in very coarse water-bearing sand just a few ft from the ocean? Answer below.

3,960,000 GALS per day were pumped round-the-clock for the life of the job—this entire flow handled by one Griffin Vac-u-matic wellpoint pump.

SUCH exceptional drainage volume —it's 55 gals per minute for each point—will surprise many contractors. Others know from repeated experience the superiority and efficiency of the Griffin system.

GRIFFIN
WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.
In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

Job Talk . . .



Steel Panels Permit Fast Form Stripping

SPECIAL FORMS are speeding completion of heating tunnels for the Craig Colony Hospital, Sonyea, New York, according to Robert Alexander, project manager for M. A. Bongiovanni, Inc., Syracuse, general contractors.

In all, some 8,000 ft of 6-ft wide by 6½-ft high tunnels are being built. However, none of them are of any great length since they lead to various buildings from a central heating plant. To get flexibility, mobility and fast setting and stripping of forms, the contractor turned to Blaw-Knox steel panels.

Pours are made in 40-ft units. After pouring the invert and stub walls, forms for the sidewalls and roof are set in place. The combined inside wall and roof form is moved into place by a hand operated traveler with wide rim wheels that run on the invert concrete.

Height of the inside forms is controlled by screw jacks on 5-ft centers along both sides. Width is controlled at the bottom by pipe jacks on 5-ft centers and at the top by steamboat ratchets on 10-ft centers.

The outside forms, which are crane handled in 40-ft sections, are set on clamps supported by anchor bolts previously placed in the invert concrete on 5-ft centers. Adjustment in height is made with wood wedges.

Two to three days setting time are required for the sidewall and, ordinarily, six to seven days setting time would be required for the roof. Because the sidewalls and roof forms are combined, this would normally mean that all forms are tied up for the full six to seven-day setting period.

However, forms are designed so that the load of the roof on the inner form is transferred to external supports spanning the conduit. This permits the contractor to strip the inside forms in two to three days rather than six to seven.

Here's how it works. Before pouring, a longitudinal channel is mounted at the top center line of the inside form and is attached through hanger rods to a series of cross channels spanning the conduit. Two to three days after pouring, the hanger rods are tightened, transferring the support of the roof from the inside forms to suspension

HEATING TUNNELS roughly 6-ft square are poured in alternating 40-ft sections.

IT'S Whiteman ALL THE WAY!

Highest efficiency, maximum speed and greatest economy in transporting and laying concrete is achieved with complete Whiteman mechanization from batching plant to the finished slab.

A. WHITEMAN CHAMPION TRUCK MIXERS offer many important features. Lighter weight, yet handle a bigger pay load. Faster charging and discharging. Easier operation. Less maintenance. Lower original cost. 7 models: 3 to 6½ yds. Rugged Whiteman construction and dependable efficiency.

B. WHITEMAN POWER BUGGIES* have definitely *proved* to be the fastest, easiest, cheapest way to place concrete. One Power Buggy does the work of five hand buggies. Speeds up to 16 mph, climbs 25% grades, turns on a dime. Never tires or loafs on the job.

*Trade Mark

C. WHITEMAN VIBRATORS are the finest made, built for outstanding performance and durability. Three "Tailored to the Job" models, gas and electric. Complete line of accessories.

D. WHITEMAN SCREEDING MACHINES do a better job in far less time. Save labor. Screed to a perfect level. Easily portable. Width adjustable from 3' to 20'.

E. WHITEMAN FINISHING MACHINES are the result of 16 years' experience, incorporate many valuable exclusive features. Float and finish at a fast, money-saving pace, produce an extremely smooth, level slab. Six models for every size job. Rotating and fixed rings.

Call your Whiteman Distributor today or send coupon now for complete information.

WHITEMAN MANUFACTURING CO. DEPT. C
13920 Pierce St., Pacoima, Calif.
Please send catalogs, prices and name of distributor for:
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Whiteman

THE LEADER IN CONCRETE EQUIPMENT

YOU NEED A CARCO WINCH TO HANDLE AN EMERGENCY LIKE THIS!

Here you see a typical construction emergency. In preparing the site for the new $8,000,000 Transport Division building of the Boeing Airplane Company at Renton, Washington, near Seattle, a 14-ton Bucyrus-Erie shovel bogged down in soft ground and was unable to move.

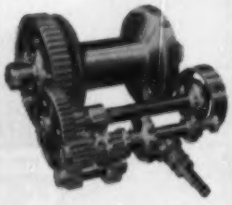
Do you, on your jobs, have the equipment needed to rescue such vital machinery quickly and economically so that your projects may move ahead on schedule?

The Red and White Construction Company of Renton, Washington, did. They simply moved in a crawler tractor equipped with one of their two Carco Model F winches. With the tractor stationary, the Carco winch pulled out the shovel in jig time.

That Carco winches can handle the toughest construction assignments is shown by statement of Mr. G. W. Bristow, one of the two Red and White partners. "We know from experience that Carco winches are ruggedly built with a world of pulling power. Though one of our Carco winches is six years old, we have had no maintenance expense at all. To put it conservatively, our Carco winches have outlasted and outperformed other equipment."

Carco winches are used by many leading contractors on heavy construction projects. Let a Carco winch help you on your next job. PACIFIC CAR AND FOUNDRY COMPANY, Renton, Washington. Branch at Chicago, Illinois.

The automatic brake lets operator set brake before pulling in load. Brake takes effect when tractor clutch is thrown out, preventing load drop or slipback. Available at extra cost on Carco Model F.



The constant mesh gear train with sliding internal gear clutch permits positive engagement and easy shifting. Power is transmitted directly through four-stage reduction gears. Model F handles all the power of tractor.

Through the years, Carco winches have earned a reputation for rugged stamina and for performance. As a result, Carco makes more winches for more makes and models of industrial tractors than any other producer.

CARCO®

from the cross channels. This permits moving the inside forms without posting the roof.

Proceeding in this manner, the combined sidewall and roof forms are free to move to another section three to four days ahead of the longitudinal channel and cross top channels.

To keep all forms busy all the time, Blaw-Knox supplied Bongiovanni with 160 additional feet of longitudinal roof channel and 32 additional top channels and hanger rods.

The contractor is using two 40-ft units of invert and four 40-ft units of combined inside wall and roof, and four 40-ft units of crane handled double outside wall forms. He is making the pours in alternating 40-ft sections.

Vibrating Screed Solves Finishing Problem

THE SERAFINI CONSTRUCTION CO. had a difficult concrete finishing problem on a highway widening job on Route #20 at Waterloo, N. Y. The job required them to lay 10-ft lanes on each side of the present two lane highway. But the lanes had to be several inches higher than the existing pavement to reduce the crown when the present road would be resurfaced. Serafini had to place wooden forms on top of the old pavement, but he faced the problem of how to finish this roadway. Wooden forms, he knew, would not stand up under the heavy weight and transverse movement of a large self-propelled finisher.

Serafini's answer was a Stow 10-ft vibrating screed. Because its beam is supported ⅛ in. above the forms on rubber mounts, no vibration would be transmitted to the wooden forms.

A 2-in. slump concrete was poured ahead of the screed, and several men spread the concrete to the approximate height of the forms. Then the Stow screed, which has a 2½ hp engine that powers the vibrating unit at 5,000 vibrations per minute, was pulled along by two men. The screed struck off and vibrated the concrete at the same time. Rough spots remaining were touched up with bull floats, and then the surface was broomed.

Bonus Quality *saves you money*

These jobs profited from a Bucyrus-Erie Dragline...yours can too!

ST. LAWRENCE SEAWAY. For larger, more demanding excavation projects like the Long Sault Canal on the Seaway, contractors prefer big-capacity machines like this Bucyrus-Erie 71-B with 3-yd. bucket.

SAN FERNANDO VALLEY, CALIF. This 54-B with 3-yd. bucket working on a Los Angeles River flood control project for the U. S. Corps of Engineers, demonstrates day after day the big output and dependability for which Bucyrus-Erie machines are well known.

SELMER, TENN. Bucyrus-Erie 15-B equipped with ½-yd. bucket cleans out a ½-mile drainage ditch on a Tennessee farm. You'll find all the essentials of profitable dragline service in Bucyrus-Eries because they are built for superlative service on jobs like yours!

LITTLE ROCK, ARK. Working in gumbo and hard clay, this 22-B with ¼-yd. bucket digs a V-type irrigation ditch for rice fields near Little Rock. Users find that Bucyrus-Erie Bonus Quality pays off in any type of digging.

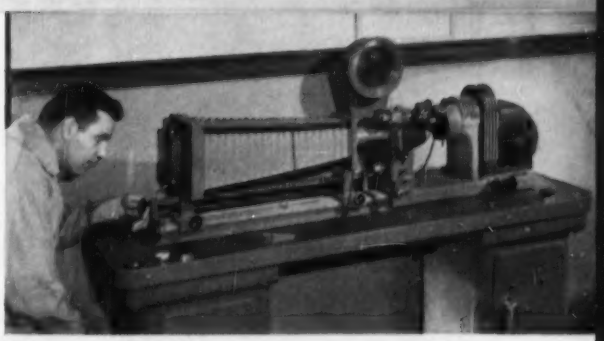
WHATEVER the job, it can profit from the extra working ability of a Bucyrus-Erie dragline. From the ground up, these machines are designed and built to put power to work moving dirt with maximum efficiency.

See your Bucyrus-Erie distributor soon and have him give you all the facts on draglines from ⅜- to 4-cu. yd.

212E56C

BUCYRUS ERIE

SOUTH MILWAUKEE
WISCONSIN



Bonus Quality This research technician is examining the grain structure of a piece of steel. All steel used by Bucyrus-Erie undergoes rigid tests to make sure it comes up to highest standards. This means machines that cost less to maintain and offer many years of extra service.

Longer tandem life

One of 9 reasons why contractors find

International Trucks

cost least to own!

In any off-highway truck operation, you need a tandem and other major components built to stand up and take it, to keep costs way down.

And cost records prove* that over the years International Trucks cost *least* to own!

The reason is simply this: It is International policy to build trucks that do the job better, do it longer at lower cost than any other make—International spends more to build the truck so it costs you *least* to own.

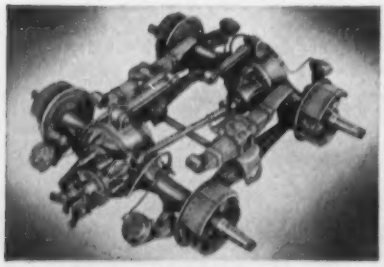
That's why there are more owners of Internationals than any other 6-wheel truck, and have been for the past 21 years!

The way to trim your trucking costs is to get together with your International Dealer, today. He's right at the other end of your phone.

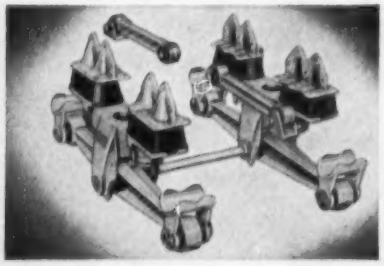
**Signed statements in our files, from fleet operators throughout the U.S., back up this statement.*

INTERNATIONAL HARVESTER COMPANY, CHICAGO

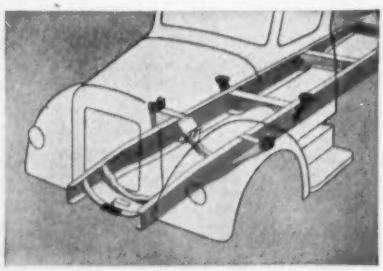
Motor Trucks • Crawler Tractors
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors



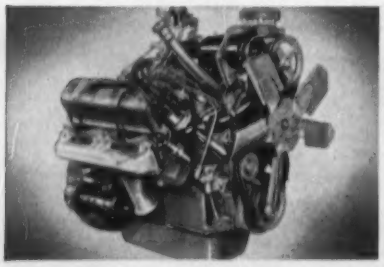
1 All International tandems give longer, more dependable life. This unit has rubber bushings at all 10 oscillating points to reduce maintenance and lengthen life. Third differential with lock transmits power smoothly and evenly to each axle.



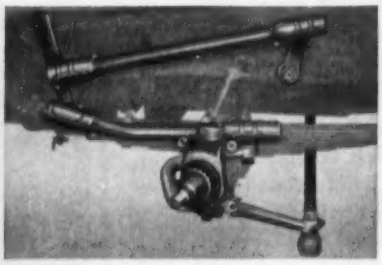
2 Lightweight suspension with rubber load cushions provide soft, easy riding, empty and loaded. Cushions reduce truck weight and servicing. Optional aluminum walking beams, spring saddles and wheels increase payloads more than 500 pounds.



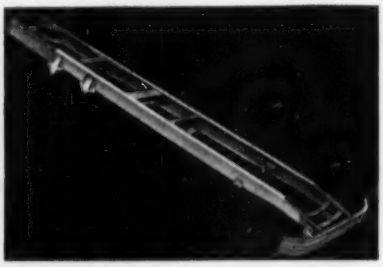
3 For cab comfort and long life. Quiet, level ride without transmitting stress to cab, fenders, hood or radiator is the result of wide spaced, rear shackle type mountings in an exclusive International 5-point rubber-insulated V-8 cab suspension.



4 Most powerful, most economical V-8's under any truck hood—206, 226 and 257 hp. for faster acceleration and higher average road speeds with less shifting. More miles per gallon of gasoline. Other gasoline, LPG and diesel engines up to 356 hp.



5 True geometric steering provides easier handling, outstanding maneuverability with short turning circles. Gears are cam and roller mounted twin lever type. Controls mounted *ahead* of the front axle. Steering wheel is comfortably positioned.

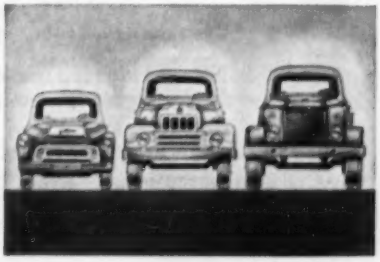


6 Steel-Flex frames combine great strength with flexibility. Heavy-duty construction plus reinforced cross-members with husky gussets provide for proper tandem suspension. Inverted L-type reinforcements give full load-length support.

International builds six-wheel models from 22,000 lbs. GVW to 76,800 lbs. GCW in conventional and COE design. There is one practically custom built for your job. Engines range in sizes up to 1091 cu. in.—famous sixes and three great new V-8's. Complete selection of all-wheel-drive models also available to make the toughest going easy. You name the job, International has exactly the right truck for it—the truck that costs you *least* to own.

7 New "silent spin" center bearings have quiet, tapered roller bearings. Prelubricated, sealed and shielded for long, trouble-free operation. Self-aligning, wide spaced rubber mountings dampen noise and vibration, eliminate service.

8 All-wheel-drive models have the extra traction and pull needed for all tough, off-highway operations. Completely factory-built, 7,000 to 33,000 lbs. GVW. Low height with ample ground clearance. Complete selection of equipment available.



9 World's most complete line. There is an International "tailor-made" for every truck job, ½ tonners to 90,000 pounders. Choice of 4-wheel, 6-wheel and all-wheel-drive models, conventional and COE design. Every one built to cost *least* to own.

Nylon cord tires reduced off-the-road tire failures...

NOW NYLON CUTS TRUCK TIRE COSTS, TOO

HANS G. BINGHAM, Shop Supt.
Dave L. Brown Company
Chattanooga, Tenn., reports

"We're switching our 147 pieces of rolling construction equipment to nylon cord tires. We've tried nylon cords for just a year, but that's enough to convince us they're big money savers. They last about 50% longer than our best standard tires. Really stand up to those twenty-ton loads... even on steep grades and rough terrain.

"In our business, road delays often mean the difference between profit and loss. Nylon cords have reduced costly tire-failure delays approximately 50%."

PROVE TO YOURSELF that nylon cord truck tires give more mileage, more retreads—lowest cost per mile. Ask your dealer about nylon cord truck tires today. (Du Pont makes the tough nylon yarns, does not produce tires.)

DU PONT NYLON for TIRE CORD

DU PONT
REG. U.S. PAT. OFF.

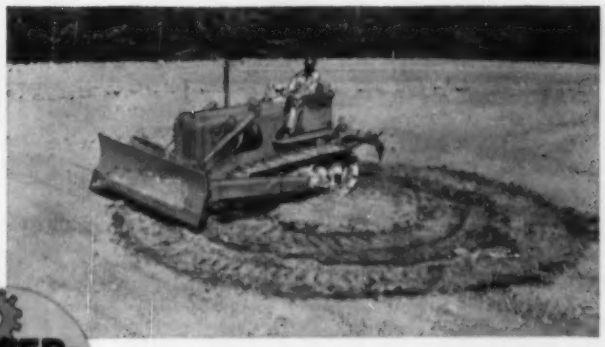
BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

NOW, IN PASSENGER-CAR TIRES, TOO . . . THE STRENGTH AND TOUGHNESS OF NYLON . . . FOR UTMOST SAFETY, SUREST PROTECTION AGAINST TIRE TROUBLE

New POWER-TURN Steering

gives you tighter turns with two-track power

Look at that turn! That's what a tight turn looks like with *full power on both tracks.* It means 100% working power at all times, even on the sharpest turns. It means added work capacity. It's POWER-TURN steering—another exclusive Oliver development.



POWER-TURN

OLIVER OC-12

...More push for your profits, too!

With 53 drawbar h.p., the OC-12 is one of the most powerful tractors of its class. Now POWER-TURN makes it pay still bigger dividends. You sweep through turns of *any* radius with full load. Or hold a straight line in angle dozing with the heaviest off-center loads.

Yet POWER-TURN is actually simpler. Two interconnected systems of control provide planetary reduction gears on each track. Here is the maximum in efficient flow of power, 100% tractive turns, better maneuvering. Operation is easier, too, with finger-tip controls to take all the muscle out of it.

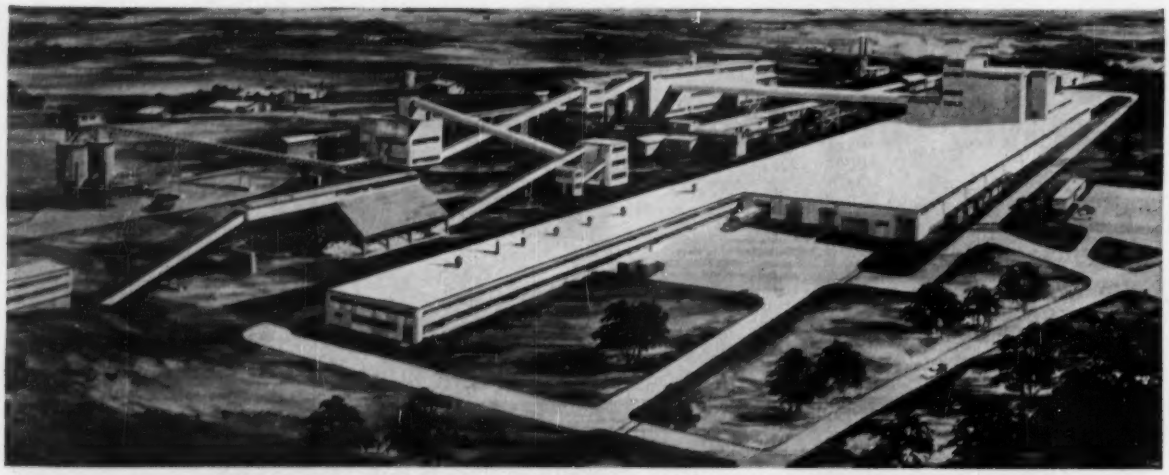
In addition to POWER-TURN, the new OC-12 offers new over-center hand clutch and foot brake for greater operator convenience. Why not sit at the controls yourself and see the difference? Your Oliver distributor will gladly demonstrate. Call him today.

THE OLIVER CORPORATION

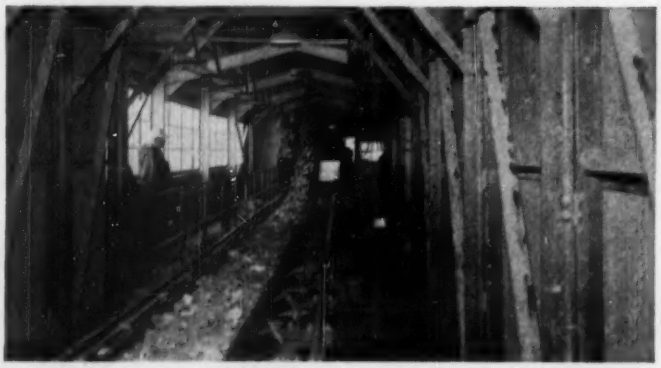
400 West Madison Street, Chicago 6, Illinois

OLIVER

A COMPLETE LINE OF INDUSTRIAL WHEEL AND CRAWLER TRACTORS AND MATCHED ALLIED EQUIPMENT



Barber-Greene installation at new Celotex plant. Ten of the eleven conveyors are housed. Building at far left houses primary crushers. At right is wallboard plant. Mill is in background.



(Left). Material rejected by the separator is carried to two storage bins by this 329-foot Barber-Greene conveyor. Standard 60-inch truss minimizes the number of supports required. (Right). A 422-foot conveyor in gallery utilizes traveling tripper to build long stockpiles.

1600′ conveyor system serves new Celotex plant

Eleven Barber-Greene conveyors are incorporated in the design of a new plant of the Celotex Corporation.

The 1600-foot conveyor system handles every product from the raw, heavy gypsum rock to the fine finished plaster. This processing requires a wide variety of types and sizes of conveyors—all coordinated to deliver continuous high capacity at lowest operating cost.

Built with *standardized* components, these versatile conveyors are delivered faster, go up easier and require less costly engineering time.

These pre-engineered components can be used in almost limitless combinations, from the most complex systems right down to the small setups requiring a single conveyor. When it comes to adapting Barber-Greene conveyors to meet changing needs, standardized components make the job easier, faster and more economical.

Write for literature on the conveyors pre-engineered to cut costs

56-23-PE

See you at the ROAD SHOW

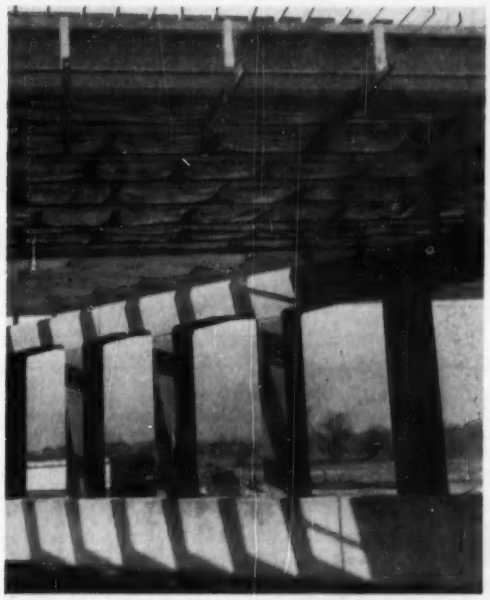
Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

discover new approach to

bridge building:



W. H. Harvie, Michigan Bridge contractor, solves curing problem with VISQUEEN film. Here's what he says: "We fasten VISQUEEN film to a wooden framework built across the underside of the 'I' beams. Makes what amounts to a heating duct. Into these ducts we feed live steam from a salamander. Gives us a perfect cure for freshly poured concrete. What's more, these closures hold the steam in and stay in place even when trains go barrelling through. VISQUEEN film is the best material we've found for the job."

Important! VISQUEEN film is all polyethylene, but not all polyethylene is VISQUEEN. Only VISQUEEN has the benefit of research and resources of

THE VISKING CORPORATION

Plastics Division, P.O. Box 1410, Terre Haute, Indiana

World's largest producers of polyethylene sheeting and tubing.

IN CANADA: VISKING LIMITED, LINDSAY, ONTARIO
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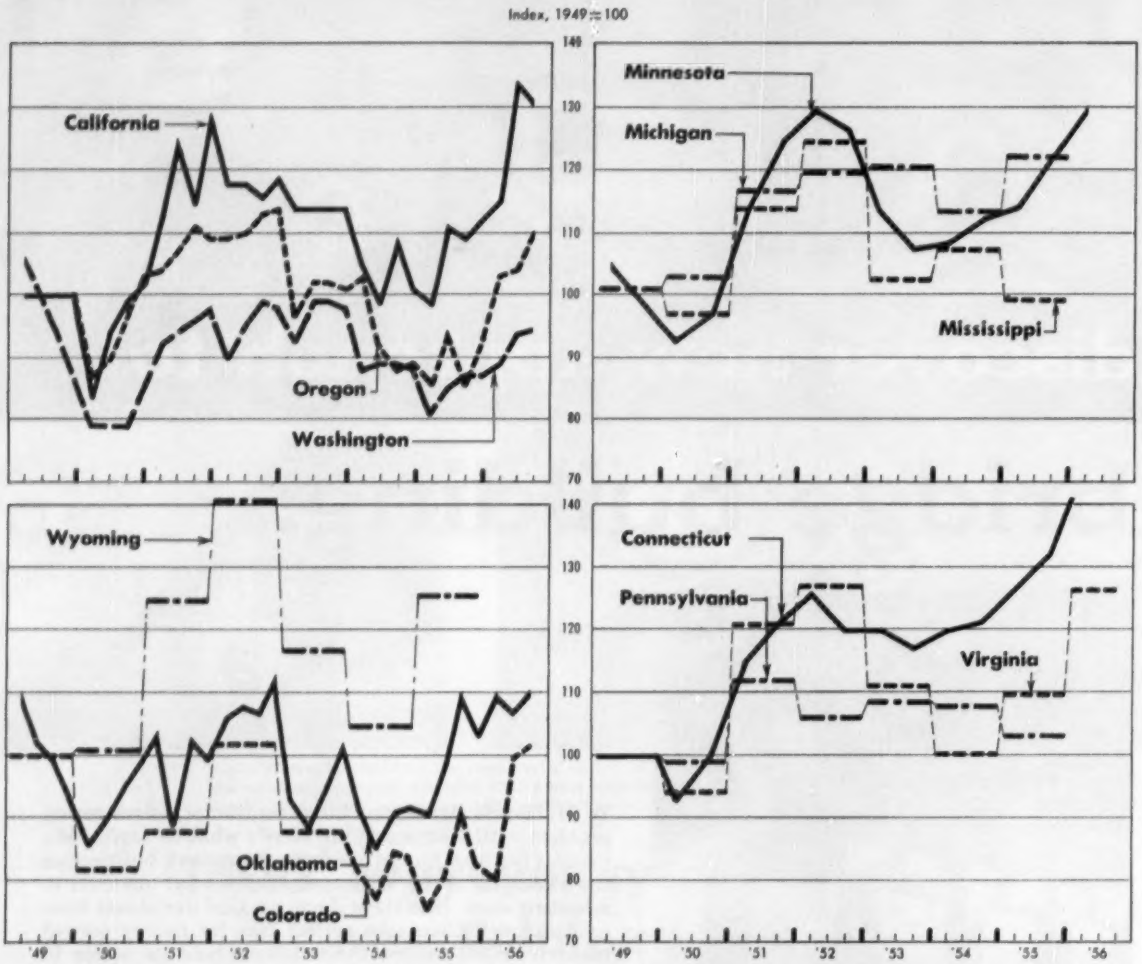
information request tag

VisQueen®

clip this tag—#CM12
attach to letterhead, mail.

It's Your Business . . .



CONTRACTOR BIDS ON HIGHWAY jobs are rising fast this year, continuing the uptrend which started in 1955. The charts above show what's happening in 12 states which calculate their own highway price indexes. These indexes are based on average unit prices bid by successful contractors on major items included in highway contracts let by the states.

Road Builders Boost Their Bids

HIGHWAY CONTRACTORS are writing much higher bids this year than last. Moreover, they are upping their bids much more than the corresponding increases in what they pay for materials, labor, and equipment. The combined cost of materials and labor is about 4.5% higher than a year ago, but contractors are charging 8.6% more for federal-aid highway work, according to the Bureau of Public Roads.

Individual states report sensational highway price increases. In Oregon, for instance, bids on jobs let in the third quarter soared 28% above the same quarter of last year, according to the Highway Department's bid price index (chart above). In California and Washington, bid price indexes have jumped by more than 19% over a year ago. And for the first nine months of 1956, bids on Connecticut state highway projects averaged 15.6% above 1955 prices. In Minnesota, the rise was 14.2%.

Montana has the sharpest rise of all states—a whopping 35.4% increase. By contrast, Idaho is the only state reporting a price decline. On Arkansas and Oklahoma projects prices show little change.

Part of the explanation for the much greater increase in bid prices than in basic costs is that contractors provided in their bids for additional price and wage raises anticipated during the period of the contract. And though most materials shortages faded earlier this year, the steel bottleneck was more serious than ever.

Continued on page 28

LORAIN 26

BIG POWER CLUTCHES RESULTS

A BIG, HEAVY-DUTY 3/4-YD. SHOVEL-CRANE

Here is a powerful and extra-husky ¾-yd. shovel-crane that can take the constant punishment of hard, *heavy-duty* service. The Lorain-26 is big, heavy and sturdy. It has lots of power, plenty of clutch capacity and a long and wide crawler, providing excellent stability in the toughest digging. Also available as 15 or 17½-ton crane. Ask your Thew-Lorain Distributor to add more facts to the features listed below—you'll see why the Lorain-26 is the machine to buy for those extra-tough jobs.

TURNTABLE FEATURES—*"E-Z" controls—all linkage mounted on anti-friction bearings • "Hydra-Ease," power, crawler controls • New, bigger 18" shoe clutches—for fewer adjustments and longer life • Big, heavy-duty, truss-reinforced, rigid turntable bed • "No-shock, no-stall" hydraulic coupling available.*

CRAWLER FEATURES—*Wide, long, heavy crawlers • 2 travel speeds in both directions • Wide, 29" drop-forged treads • Sealed idler rollers on anti-friction bearings available • Independent travel available, ideal for hoe and dragline service.*

BOOM FEATURES—*3 hoe dippers—30" to 40" • Longer, stronger 19-ft. shovel and 19-ft. hoe booms • Full manganese shovel dipper for heavy-duty digging • Independent cable crowd on shovel • Usable as shovel, crane, clamshell, dragline or hoe.*

The Lorain-26 Hoe digs deeper in harder materials, has excellent stability to give greater digging ranges. All-welded, box-section, rugged boom is "goosenecked" for deep digging.

THE THEW SHOVEL CO., LORAIN, OHIO

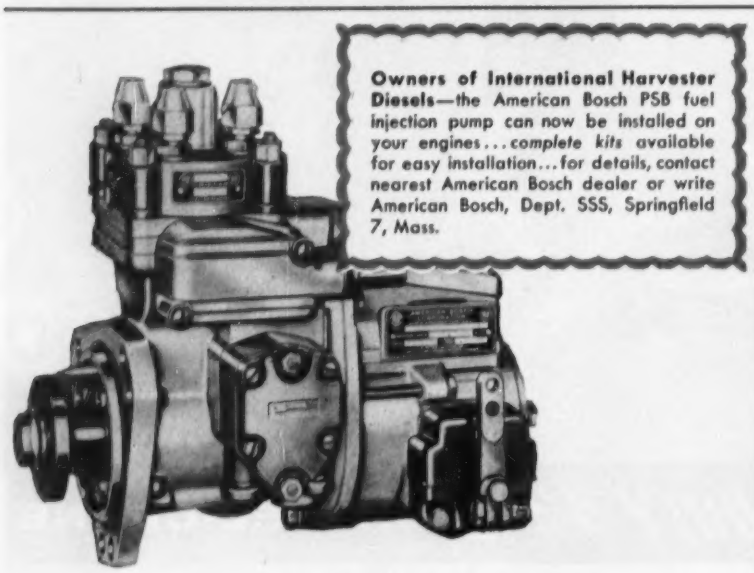
THEW LORAIN

While bid prices are up 8% overall, a BPR sub-index shows that structural steel bids are up 23.5% and reinforcing steel bids are up 13.6%. One reason for these sharp rises is that in the fact of shortages and delays in delivery, the contractor must protect himself by including these uncertainties in his bid price. If he can, he is also trying to protect himself against almost certain future increases in labor and equipment costs.

Construction Machinery Prices

Bureau of Labor Statistics Primary Market Index 1947-49=100

TYPE OF EQUIPMENT	October 1956	October 1955	Percent Change From Sept '56	Percent Change From Oct. '55
All types	154.4	142.1	+1.9%	+ 8.7%
Power cranes & shovels	154.3	142.8	+2.1	+ 8.1
Tractors	168.7	151.8	+2.3	+11.1
Scrapers and graders	148.9	139.3	+0.9	+ 6.9
Mixers and pavers	138.1	130.2	+2.7	+ 6.1
Machinery, tractor-mounted	150.8	140.8	+1.0	+ 7.1
Specialized machinery	140.1	131.4	+1.6	+ 6.6
Portable air compressors	133.2	133.6	0	- 0.3
Air tools, hand held	150.0	135.7	0	+10.5



Owners of International Harvester Diesels—the American Bosch PSB fuel injection pump can now be installed on your engines . . . *complete kits* available for easy installation . . . for details, contact nearest American Bosch dealer or write American Bosch, Dept. SSS, Springfield 7, Mass.

the PSB fuel injection pump

UNEXCELLED

. . . for performance and outstanding service—that's the acknowledged record of more than 100,000 American Bosch PSB pumps now in use.

Here's some reasons why! Simple construction . . . fewer parts . . . accurate fuel metering and distribution . . . positive governor control . . . replaceable hydraulic head for fast field servicing.

What's more—all American Bosch fuel injection products are backed by a growing system of authorized service agencies, fully equipped to provide quick, efficient repair service.

Unequaled value—for top diesel engine performance and economy of operation . . . long trouble-free life . . . lower maintenance expense—nothing equals a PSB fuel injection pump.

AMERICAN BOSCH

Division of

American Bosch Arma Corporation
Springfield 7, Mass., U. S. A.

4493

More Equipment Price Increases

Construction equipment makers marked up price tags on most types of excavating and earthmoving machines during October. This was reflected by the Bureau of Labor Statistics primary market index for construction equipment prices which rose nearly 2% over September. This brought the rise during the first 10 months of 1956 in this equipment price index to 7.8%.

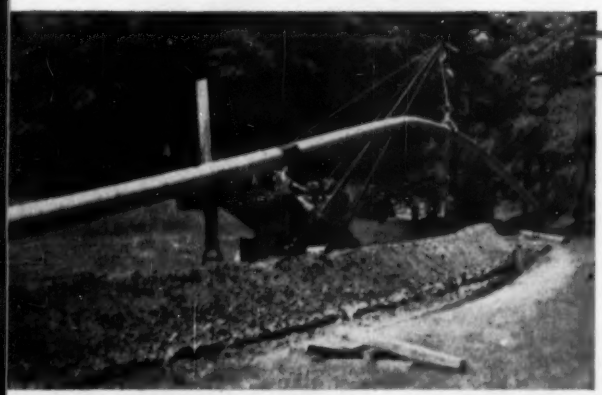
Much of the equipment price rise traces back to higher steel prices. During the 16 months since June 1955 steel mills have put into effect two substantial general price increases that have pushed the mill price average for iron and steel up about 17%, according to the BLS Index. Over this same period, construction machinery prices have increased about 14.6% according to the BLS index.

In addition to higher steel prices, increased costs of labor and other materials were cited by manufacturers, who have attached higher price tags to their equipment. During the last three months, price increases have ranged generally between 4% and 10% depending on the manufacturer and the type of machine.

Next year is expected to bring some further rise in equipment prices, though it should be more moderate than the 1955-56 rate of increase. CM&E estimates that the BLS construction machinery price index for 1957 will be 3% to 4% higher than in 1956. The reasons: steel prices are expected to go up again next year; labor is expected to add to its wage gains; equipment makers will pass on what they can of increased materials and labor costs in higher prices.

The table above shows how manufacturers' prices of construction machinery are moving up.

The CLEVELAND 80W



—a SIDECRANE

- Lays pipe • 30,000 Ft. Lb. Capacity
- Power Boom...Up and Down • 4 Line Speeds
- Long Reach...21 Feet • Sets Bends, Valves
- Unloads...Strings • Pulls Sheathing, Etc.

—a BACKFILLER

- Backfills Fast...20 Passes Per Minute
- 4½ Ft. Scraper Board • Backfills Clean
- Stays off Completed Work • Backfills from Either Side of Trench • Works Safer... Parallels Work • Fits All Job Conditions

—a TAMPER

- Fills and Tamps Simultaneously
- One Machine...One Operator Does it All
- Meets Density Specifications • Tamps from the Bottom Up • Parallels Work... No Straddling • Tamps Wider...Tamps Safer

—Does ALL 3 Related Jobs—*Better!*

In 1957 USE THE 80W AND SAVE...ON MONEY, MEN AND MACHINES

See It at the Road Show, Jan. 28-Feb. 2, North Hall, First Floor, Location B.

GET THIS 12-PAGE BULLETIN *NOW!*

- Complete Specifications
- Detailed Description of All Features
- Dozens of On-the-Job Action Photographs of Numerous Applications

Good Everywhere

THE CLEVELAND TRENCHER COMPANY

20100 St. Clair Avenue • Cleveland 17, Ohio

WEIGHT OF TYPICAL BATCH:

Portland cement . . 831 lbs.
Natural cement . . . 143 lbs.
Sand . . . . . 1222 lbs.
1-inch stone . . . . 1448 lbs.
2½-inch stone . . 1767 lbs.

145 BATCHES AN HOUR *speed*

Paving contractor on a large air base in one of the central U. S. states needed a fast, dependable batch plant that would turn out approximately 130 batches an hour. To meet production requirements, a fully-automatic Johnson one-stop plant was installed on a rail siding, a short haul from the immediate paving area.

Supplied by rail, truck

Bulk cement, delivered by rail car, was stored at the plant in three Johnson 825-barrel silos. Sand and stone, delivered by truck and rail, were fed into three Johnson auxiliary storage bins by a traveling stacker. From there, aggregates were fed to the batch plant by inclined conveyor.

Kept two 34-E pavers busy

With this efficient material handling system, the 5-compartment bin on top of the batch plant was stocked continually. The plant accurately weighed out aggregates and cement ahead of heaviest schedules — kept two 34-E pavers busy full time pouring 12-inch slab. While the plant's top-speed potential of 180 batches an hour could not be fully utilized due to normal job delays, this *reserve production capacity* easily assured an average of 130 batches an hour. In fact, during one 11½-hour period of peak operation, it weighed out a total of 1669 batches. That's an average of better than 145 batches an hour.

Actual pour for the 11½-hour day was 2300 cubic yards of concrete — or 200 cubic yards an hour. Each batch weighed 1.38 cubic yards, and consisted of five materials — sand, two sizes of aggregates, and two types of cement.

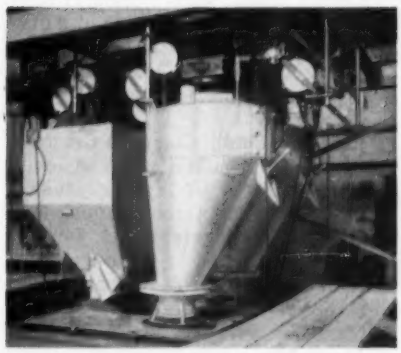
20 second batch-time

On this one-stop operation, average batcher fill-time was 10 seconds — discharge time, 10 seconds. Automatic control maintained high output, and assured pin-point weighing accuracy of every batch. A separate fully-automatic batcher was used for each of the aggregates and cement — all weighing up at the same time. These single-material Johnson batchers operate on electro-pneumatic control. Fill valves and discharge gates are automatic air-ram operated.

Johnson batch plants also can be arranged for two- or three-stop charging. Investigate the possibilities of increasing concrete production on your highway and airport paving. Get the complete story on Johnson automatic batch plants with multiple arrangements of single-material batchers, and one-man push-button control. All sizes, all types. See your Johnson distributor, or write us for latest batch plant catalog.

JOHNSON *automatic* BATCH PLANTS

paving job



Multiple batch selections

In Johnson single-material plants for roadbuilders' use, dial scale with electric cut-off switch is usually used. When more than one type of batch is required, Johnson single-material batchers can be equipped with mix selector and recorder for 12 different batches — all controlled from central operator's position. (Each aggregate batcher can be equipped with moisture compensator which automatically gives dry weight.) Up to 120 batch selections are available on Johnson automatic concrete plants for dams and commercial ready-mix installations.

C. S. JOHNSON COMPANY
CHAMPAIGN, ILL. *(Koehring Subsidiary)*

Truck-loading with 16-S concrete mixer

Producing concrete for curbs and gutters, Kwik-Mix 16-S loads batch into trucks from ground-level. Tower loader gives 9 ft.-2 in. discharge height. Bucket holds full batch, is powered by mixer engine, dumps automatically at top of tower. Also available on 11-S Dandie®, and Kwik-Mix bituminous mixers for stockpiling and loading into trucks, overhead hoppers and forms. Ask Kwik-Mix distributor for more information, or write us.

KWIK-MIX• Port Washington, Wis.
(Koehring Subsidiary)

Puts trenching on fast "work-and-run" basis

Next job is only minutes away with this rubber-tired Trenchmobile®. It runs from job-to-job over city streets, highways or cross-country at 12.6 m.p.h. Works fast, too. Digs up to 14½ feet per minute, 8 to 16 inches wide, 5 feet deep. Sloping ladder boom undercuts walks, curbs, gutters, makes vertical set-ins. Hydraulic-control backfill blade optional. Also check big Parsons line of crawler-mounted wheel-type and ladder-type Trenchliners®.

PARSONS • Newton, Iowa
(Koehring Subsidiary)

No room to turn here— and no need to turn

Shuttling back and forth on overhead trestles, in tunnels, on narrow haul roads, Koehring 6-yard Dumptor® travels round trip without turning. It has the same speeds forward and reverse — operates with equal ease in either direction. Every turn eliminated saves 15 seconds, cuts cycle-time. You'll also like its one-second gravity-dump (no body-hoist), 24% gradeability, and other heavy-duty advantages for off-road haul.

KOEHRING Company
Milwaukee 16, Wisconsin
VSS

What Do You Get In A BUCKET-
?
BALANCED DIGGING POWER
•
PROPER SHELL DESIGN FOR CAPACITY LOADS
•
LOW CENTER OF GRAVITY
Plus
"A MOUTHFUL AT EVERY BITE"
IF it's an OWEN BUCKET
Yes, there are decided differences between OWEN clamshell buckets and clamshell buckets.
These differences originate in the engineering department, on the drawing board and culminate in actual superior bucket operation.
Make your own opinion-survey of "bucketwise" crane operators. You'll find the big majority of them will express a definite preference for OWEN buckets.
Write for the Catalog...
OWEN
CLAMSHELL BUCKETS
BIGGER DAYS WORK
THE OWEN BUCKET CO.
BRANCHES, NEW YORK, PHILADELPHIA, CHICAGO, BERKELEY, CALIF., FORT LAUDERDALE, FLA.

SOME BIG CONTRACT AWARDS OF THE MONTH

J. A. Jones Construction Co., Medical Arts Bldg., Seattle, Wash., and Charles H. Tompkins Co., 907 16 St., N. W. Wash., D.C. Swift Dam 510-ft high zone-type rolled earth dam for Swift Hydro-Electric Dam on Lewis River, Washington for Pacific Power & Light Co., 290 S.W. 6 St., Portland 43, Ore. $18,272,000.

Morris & Robertson Contractors, Wichita Falls, Tex. Construct and finance 922 housing units for airmen and families and 613 housing units for officers and families at Capehart Housing, Little Rock Air Force Base, Jacksonville, Ark. for U.S. Eng., P.O. Box 867, Little Rock, Ark. $16,000,000.

Morrison-Knudsen Co., 319 Broadway Ave., Boise, Idaho; Henry J. Kaiser Co., 1924 Broadway, Oakland 12, Calif.; Macco Corp., 14409 Paramount Blvd., Paramount, Calif.; B. Perini & Sons, Inc., 73 Montwait St., Framingham, Mass. Tunnel and Haas underground power house on north fork of Kings River, Fresno Co., Calif for Pacific Gas & Electric Co., 245 Market St., San Francisco 6, Calif. $80,000,000.

Costanza Contg. Co., 6515 Crescent Blvd., Pennsauken, N.J. A one-story 280x440-ft manufacturing plant, Woodcrest, Haddonfield, N.J. Hussman Refrigerator Co., 2401 N. Leffingwell Ave., St. Louis, Mo.; Louis T. Klauder & Assocs., Phila. National Bank Bldg., Broad and Chestnut Sts., Phila., Pa., engrs. $5,000,000.

Ralph M. Parsons Co., 617 S. Olive St., Los Angeles, Calif. A 12,000 bbl per day catalytic sovaformer gasoline fractionating and off-site facilities, Torrance, Calif for General Petroleum Corp., Torrance, Calif. $8,000,000.

Westinghouse Electric Corp., P.O. Box 868, Pittsburgh 30, Pa. Unit 6, St. Clair Power Plant, 300,000-kw turbine generator, Michigan for Detroit Edison Co., 2220 Second Ave., Detroit 26, Mich. $8,000,000.

Swinerton & Walberg, 200 Bush St., San Francisco, Calif. New box board mill, Santa Clara, Calif. for California Container Corp., 2500 De La Cruz Blvd., Santa Cruz, Calif. $6,300,000.

THE INDUSTRIAL TRACTORS THAT *SMASH* THE PERFORMANCE BARRIER!

POWER LINED WHEELERS

by MM MINNEAPOLIS·MOLINE

SEE THESE NEW OUTWORK ANYTHING

335 INDUSTRIAL WHEELER

Here's new performance and new class in this power and price bracket! Packs 47 b.h.p. with a big 165 cu. in. high-compression engine, offers wide choice of hydraulic pumps for operating front or rear-mounted equipment. Ampli-Torc 12-speed drive, 3-point hitch, and power steering.

NOW . . . 5 GREAT MM INDUSTRIAL TRACTORS — A FULL LINE OF ALLIED

335 INDUSTRIAL WHEELER
Post Driver or Auger Digger cuts placement costs with PTO drive and 3-point mounting. One man runs this cost-cutting rig.

445 INDUSTRIAL WHEELER
Front End Hydraulic Loaders handle bulk material or palletized loads, speed every job. Gasoline or LP gas.

445 UTILITY WHEELER
Rear-mounted Hydro-Blades or Scoops do grading and ditching, take only minutes to mount or dismount. Gasoline or LP gas.

UTIL WHEELER
The standard of industry! UTIL Wheelers offer "shuttle gears" for 6 speeds forward . . . 6 reverse, instant shifting. MM Diesel or Gasoline.

POWERlined WHEELERS ELSE IN THEIR CLASS

● Last year's job costs go out the window with this Wheeler-Loader-Backhoe at work! New high-turbulence 57 bhp 445 Wheeler with Ampli-Torc to *double* power on-the-go makes a mean dozer . . . a fast-cycling loader. The precision mounted pumps (practically any size you want) give you a maximum speed and a new high in hydraulic efficiency. 445 prices are realistic and it's a money-maker. Ask your MM Dealer. He'll surprise you!

445 INDUSTRIAL WHEELER

Champion in the ¾-cu.-yd. loader class! This 445 Wheeler has a 57 bhp engine and all the POWERlined advantages! The 445's big-capacity hydraulic 3-point hitch handles all standard 3-point equipment and the extra-heavy 3-point tools—offers weight and muscle for toughest jobs.

THESE ARE THE POWERlined ADVANTAGES!

1. Big-displacement, high-compression engines—new from the crankshaft out!
2. Built-in hydraulic power steering is optional on all POWERlined Wheelers!
3. Ampli-Torc 12-speed transmissions (optional) let you double tractive power in any gear at the touch of a lever—without clutching—without shifting—on the go!
4. Hydraulic-controlled 3-point hitch systems designed to handle all standard 3-point equipment!
5. Hydraulic pumps are part of the tractor—in wide range of capacities!
6. Independent rear power-take-off—constant running, constant speed! Front PTO for side-mounted equipment.
7. Full selection of allied 3-point and front-mounted equipment!

EQUIPMENT!

GB WHEELER

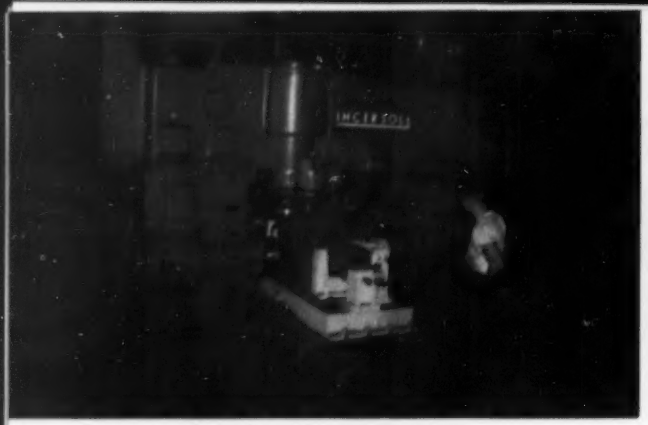
MM's most powerful industrial tractor! Offers big capacity with MM's Wheeler mobility. MM Diesel, Gasoline or LP gas.

THE GOLDEN POWER LINE

MINNEAPOLIS-MOLINE

INDUSTRIAL POWER DIVISION

MINNEAPOLIS 1, MINNESOTA



Top and ends of differential cases are milled in one operation through this automatic machine. Result: New precision tolerances!

Push-button controls allow complete operator control of new production tools through all work cycles.

POWERLINED WHEELERS

NEW AS THE NEWEST TOOLING CAN MAKE THEM!

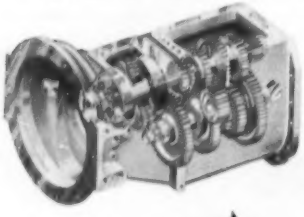
How do we know for certain that these POWERlined Wheelers are the last word in industrial tractor design?

Because we discovered that POWERlined design standards were so high, manufacturing problems so completely different from anything ever before attempted, that only the most advanced tooling and production methods could do the job!

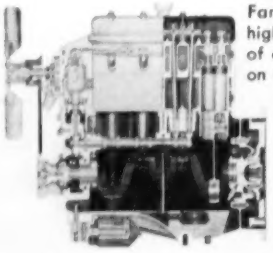
Performance requirements of the POWERlined series of MM Industrial Tractors were set in the hustle-bustle of hundreds of actual job sites, where split-second response and unheard-of power-speed ranges proved a must. To build the tractors that could meet these requirements, Minneapolis-Moline retooled from top to bottom—the biggest retooling project in MM history!

That's why you can expect a *new* step ahead in performance from these POWERlined Wheelers—a new step ahead from a company that has always stood at the top in performance. These are the tractors only MM could design . . . and only modern machinery could build!

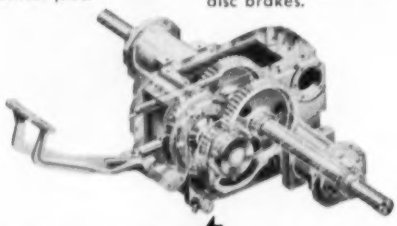
NEW AMPLI-TORC DRIVE!
Change top power to top travel speed in every gear without shifting, without clutching—on the go!



NEW ENGINES!
Famed MM high-turbulence, high-torque power with a host of advantages for longer life on tough industrial jobs.



NEW FINAL DRIVE!
One-piece bull gears, forged-steel differential gears, single-unit final drive and rear axle housing, heavy-duty double-disc brakes.



See you at the ROAD SHOW, CHICAGO, Jan 28—Feb. 2, 1957

MINNEAPOLIS-MOLINE MINNEAPOLIS 1, MINNESOTA

Send me complete performance data and specifications on the new POWERlined series of MM Wheelers. I am especially interested in the following tractors:

☐ 335 INDUSTRIAL WHEELER ☐ 445 INDUSTRIAL WHEELER
☐ 445 UTILITY WHEELER

Also include complete information on the following:
☐ UTIL WHEELER ☐ GB WHEELER

Name _____ Title _____

Firm or Department _____

Address _____

City _____ State _____

☐ I am a dealer interested in an MM franchise. I understand some top-rated territories are open and would like to get more facts.

Yes . . . I want the down-to-earth facts . . . all of 'em—on NEW POWERlined WHEELERS by **MM**

Printed in U.S.A.

LEHIGH EARLY STRENGTH CEMENT

speeds production of prestressed bridge units

For maximum production efficiency, Juno Prestressors, Inc., uses Lehigh Early Strength Cement in the manufacture of prestressed concrete units for Florida State Road and Turnpike bridges.

With Lehigh Early Strength Cement, their prestressed beams, for instance, reach the specified strength of 4000 P.S.I. in ½ the time required with regular cement . . . without the use of any accelerated curing methods. This makes it possible to expedite the movement of the finished products and to *double the output of casting beds* without Saturday or Sunday work.

This is another example of the advantages of Lehigh Early Strength Cement in modern concrete construction.

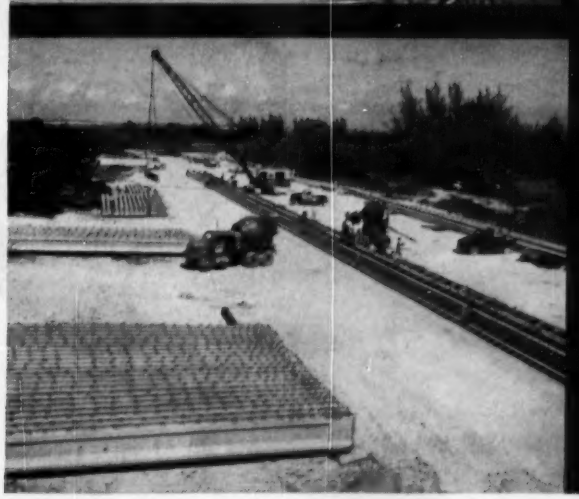
LEHIGH PORTLAND CEMENT COMPANY

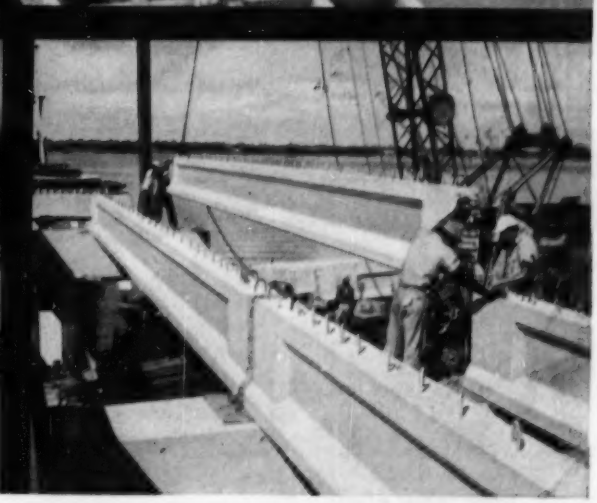
ALLENTOWN, PA.

LEHIGH EARLY STRENGTH CEMENT
LEHIGH MORTAR CEMENT
LEHIGH PORTLAND CEMENT
LEHIGH AIR-ENTRAINING CEMENT

PRESTRESSED CONCRETE DESIGN SAVES FLORIDA TAXPAYERS 10%.

One of two bridges crossing St. Lucie and Indian Rivers in Martin County, Florida, erected by Cleary Bros. Construction Company. The prestressed concrete design saved Florida taxpayers 10% over other alternates.





Casting yard of Juno Prestressors, Inc. a subsidiary of Cleary Brothers Construction Company, West Palm Beach, Florida. Ready mixed concrete supplied by Rinker-Riviera Company, Riviera Beach, Florida.

Pretensioned beam being placed. Beams are 47' 3" long, 3' deep. They measure 12" at the top, 18" at the bottom. Web is 6" thick. Piling is 20"x 20". Both beams and piles were made with Lehigh Early Strength Cement.

Announcing

a new "package"
for the road builder

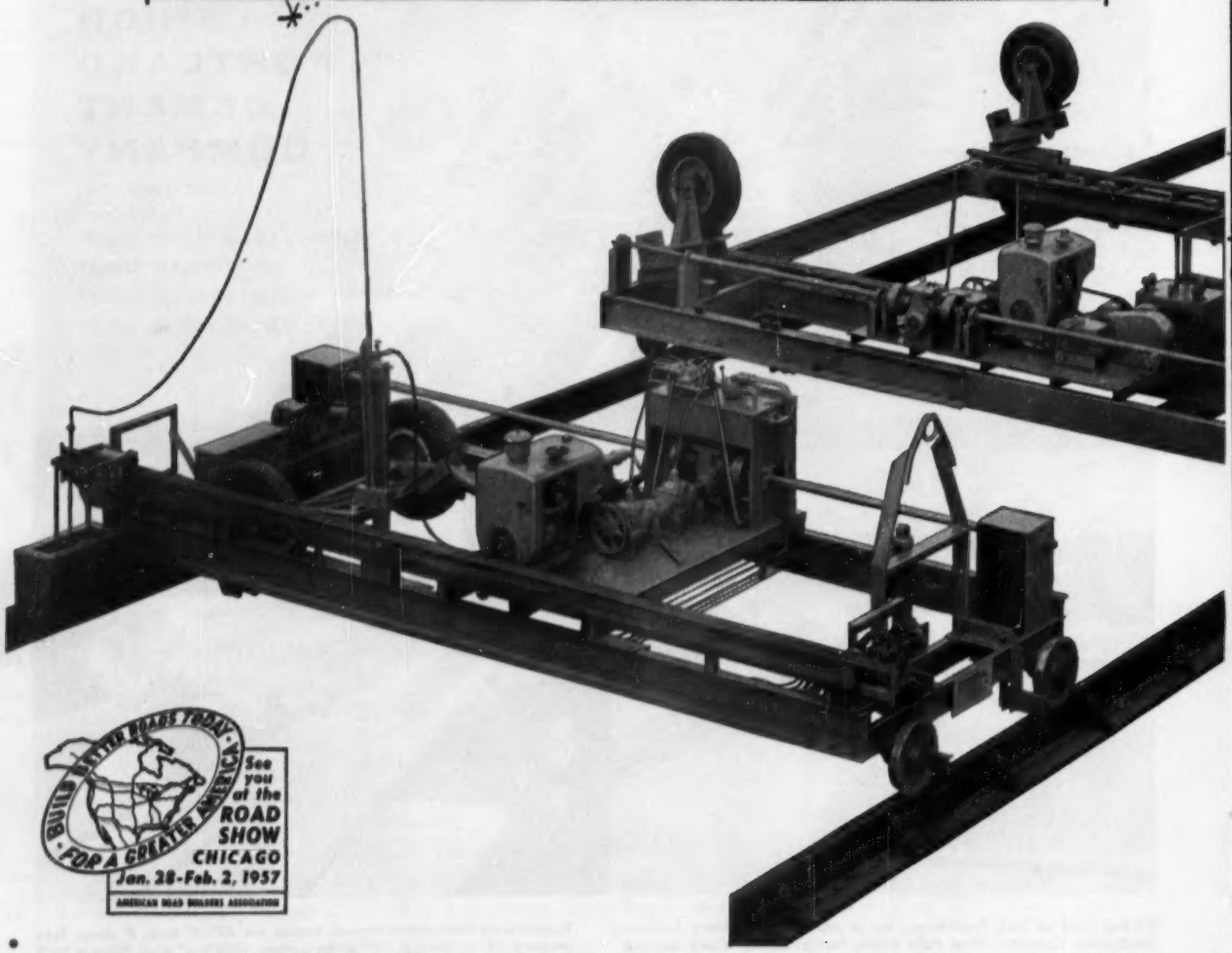
REX®

CHAIN BELT COMPANY

GENERAL ROAD MACHINES

Pavers Forms Subgrade Planers
Spreaders Finishers Floats Curing Machines

The *Complete* Line of Portable, Powered-Frame Widened Concrete Paving Equipment



BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA ·
See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957
AMERICAN ROAD BUILDERS ASSOCIATION

Here's the job-speeding, cost-cutting concrete road building "package" contractors have been seeking. The combination of CHAIN Belt and General Road Machines provides a complete equipment answer from forms to curing machines—a quality line of concrete paving equipment that is unmatched in its ability to answer your needs...unequaled in its over-all ability to speed job progress.

Now, from a single source, you can get pavers, spreaders, finishers, floats, curing machines, forms, subgrade planers—the complete package of concrete paving equipment. A single source of responsibility means better equipment performance for you...matched quality that adds up to lower cost operation.

Why not get the complete story on the new package that can step up your paving profits...the many exclusive features offered only by these quality machines. Write CHAIN Belt Company, 4664 West Greenfield Ave., Milwaukee 1, Wisconsin.

CONSTRUCTION REX MACHINERY

PAVERS • SPREADERS • FINISHERS • FLOATS • CURING MACHINES • FORMS

CHAIN BELT COMPANY

MOTO-MIXERS • BUILDING MIXERS • PUMPCRETE • RAILPORTER • PUMPS

BLAW-KNOX RECTANGULAR BOX SEWER FORMS

save time and cut costs on
Proctor Storm Drainage Project built by

SLOVAK BROTHERS

Corpus Christi, Texas

■ Here's another typical example of Blaw-Knox Steel Form Engineering which allowed this Corpus Christi general contractor to average daily pours of 80 feet on 10-ft. wide sewers, and meet all job specifications. The Proctor Storm Drainage Project required 1,710 feet of sewage conduit 10′ wide by 9′ high; 1,722 feet 10′ x 8′; and 2,843 feet 8′ x 7′, for a total length of 6,275 feet. One set of Blaw-Knox special rectangular box type adjustable forms easily handled the three sizes of conduit. The unique feature of the project was the system devised by Blaw-Knox engineers for supporting the conduit roof during pouring and curing. By using four sets of cross beam supports tied together with the outside forms, Slovak Brothers maintained a continuous pouring pace with one set of forms.

PLAN YOUR JOBS WITH BLAW-KNOX STEEL FORMS AND BLAW-KNOX CONSULTATION SERVICE

Cut *your* concreting costs by consulting Blaw-Knox in the preliminary planning stage of your next job. Blaw-Knox engineers have undoubtedly solved similar problems and saved money for other contractors, so by taking full advantage of the Blaw-Knox Steel Forms Consultation Service, you are assured of recommendations and proposals for the most efficient concreting methods and the most economical forming equipment. With over 40 years' experience as the original and most prominent manufacturer of Steel Forms, Blaw-Knox specializes in helping you plan for the simplified forming that builds your profits by keeping costs low. Write for details today.

BLAW-KNOX COMPANY

STEEL FORMS DEPARTMENT • BLAW-KNOX EQUIPMENT DIVISION
P. O. BOX 1198 • PITTSBURGH, PA. • PHONE STERLING 1-2700

50th Anniversary BLAW-KNOX 1906 1956

BLAW-KNOX STEEL FORMS CONSULTATION SERVICE

"Ahead of schedule"

on 8-mile farm-road job says Texas contractor

Pennington's busy C Tournapulls pass on haul road. Fill area is beyond last scraper. Ability of these earthmovers to work at constant high speeds helped complete farm-road 1093 job ahead of schedule.

"Our 4 'C's' put us ahead of schedule on this job", stated C. E. "Tip" Heatherly, general superintendent for Contractor Dan Pennington, Grapeland, Texas. He was talking about an 8-mi. construction job on farm-road 1093, north of Eagle Lake, Texas, which the firm handled with its Tournapulls.

"These 'C's' work good in anything," Heatherly said. "I like their maneuverability — the way they get in and out of tough spots."

'Pulls handle 90% of yardage

Pennington used a scraper line-up of 4 LeTourneau-Westinghouse C Tournapulls and 1 crawler-with-pan for the 9-month job. The four "C's" (16 yds. heaped capacity) did 90% of the dirtmoving. The two-lane highway was bid jointly by Dan Pennington of Grapeland, Texas and H. Ratliff of Rogers, Texas, in the amount of $442,515, with Mr. Ratliff doing the concrete and Pennington doing the dirt, base and asphalt. Close to 250,000 yards of material had to be moved in the course of road construction.

Loads in wet sand

When work started, machines worked in sand, wet down by heavy rains. Cut was 800′ in length.

Heaping loads of wet sand boiled into bowls of "C's" during road construction near Eagle Lake, Texas. Frequent rains failed to slow scraper production on this winter job.

"Pulls" spread fast in sand. Operators had no trouble in slippery footing. Rig's 90° power-turn and power-transfer differential aided maneuvering when sand was wet.

New C Fullpak even better!

The same dependable performance in rough going can be yours on your next job. For even *better* production, ask about the new 18-cu. yd. C Fullpak Scraper. This high-production "Fullpak" loads fast, boils easy, heaps a big load every time!

Tournapulls hauled an average 1100′ over spongy-footing...spread fast over 70′ distance. Cycle distance averaged 2668′.

Tournapull cycle-time was 5.85 min. Other averages were — 1.14 for loading, 2.07 for hauling, 0.44 for spreading, and 2.20 for return. Each machine moved 10 loads an hour. All scrapers worked a 10-hr. day, 5½ days per week.

W. F. Kitchens, Jr., a Pennington operator, said: "I've been running Tournapulls since 1951, and I like the C Tournapull fine — mostly because it's so easy on me."

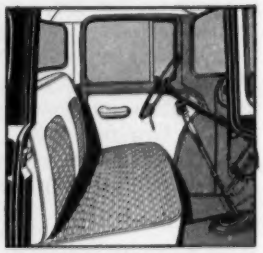
Tournapull—Trademark Reg. U.S. Pat. Off.
Fullpak—Trademark CP-1054-H-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

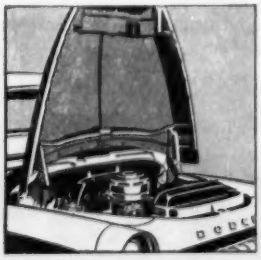
ARBA See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

FIRST NEW



NEW COMFORT CABS

Industry's largest, for real stretch-out comfort. All-new seat design permits adjustment of back cushion and seat height, plus normal slide positioning.



FULL-OPENING HOOD

Exclusive!—Can be raised full 90° for easiest, fastest engine servicing, half-way for routine oil and water checks.

Stake models up to 21,000 lbs. G.V.W.

SHOWING

DODGE

PowerGiants

- **NEW giant-power V-8 engines!**
- **NEW push-button driving!**
- **NEW higher load capacities!**
- **NEW *Forward* Look Styling!**

Get set to profit from a great *new* kind of truck—with *more* V-8 power and *more* payload capacity—with *more* eager-to-go snap than any other make on the road!

From 204-hp. pick-ups to 232-hp. tandems, today's new low-priced V-8 Dodge *Power Giants* deliver more truck per dollar—and more profitable payloads—in *every* weight class, 4,250 lbs. G.V.W. to 65,000 lbs. G.C.W.

New short-stroke Chrysler-engineered V-8's—with exclusive Power-Dome combustion—give you more miles per gallon, full power on *regular* gas. Increased power in famous, dependable Dodge 6's, too.

Push-button automatic transmission is still another great plus you get only in new Dodge *Power Giants.** First in any truck! Simple, sure, trouble-free. Just push a button, shifting is automatic.

Test-drive a Power Giant—V-8 or 6—soon! Get your Dodge dealer's deal *before* you decide on your new truck.

**Available on low-tonnage and forward-control models.*

DODGE TRUCKS

WITH THE *FORWARD* LOOK

4 pick-up models up to 8,800 lbs. G.V.W.

Tandem models up to 46,000 lbs. G.V.W.

Tractor models up to 65,000 lbs. G.C.W.

4-wheel-drive models up to 16,000 lbs. G.V.W.

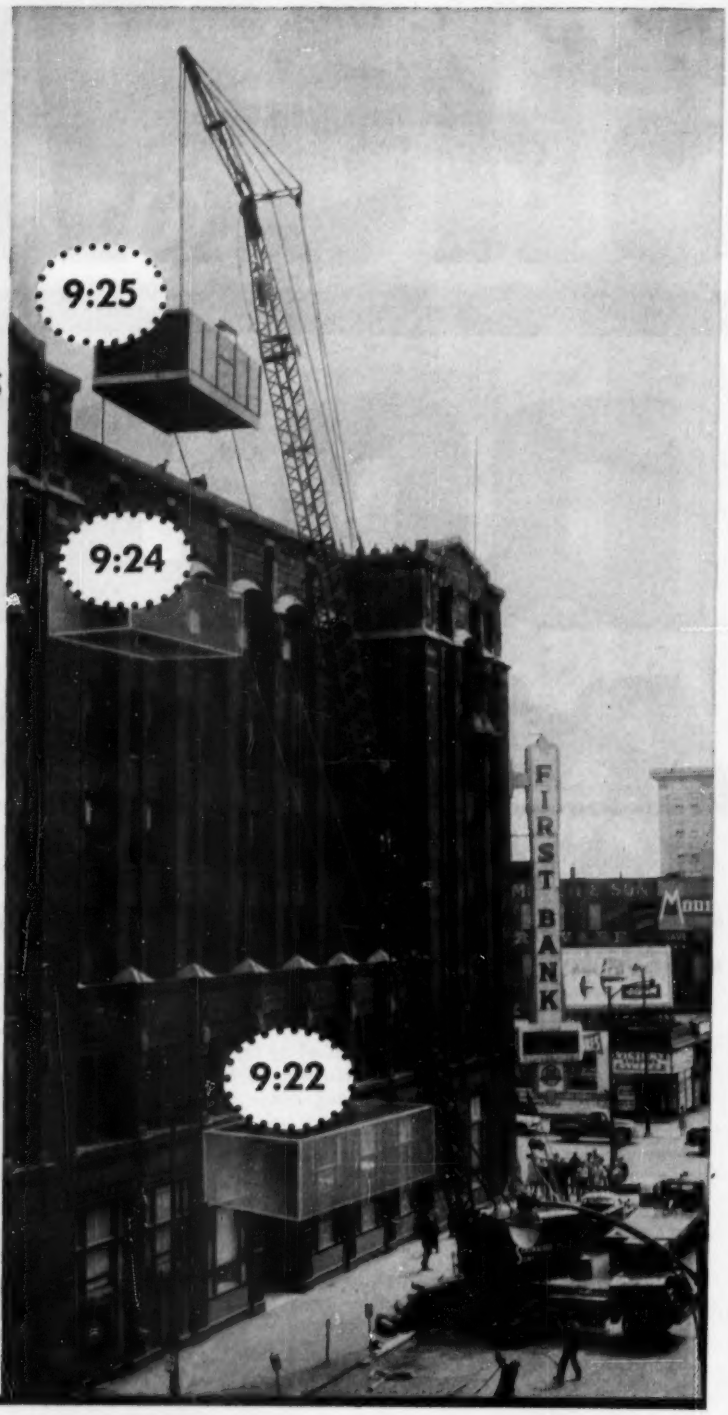
HOW 8,000 lbs. was safely hoisted 75 feet in THREE minutes flat!

Schumacher used 110 foot boom and 15 foot jib on his 25 ton BAY CITY CRANEMOBILE

Three minutes from street to roof—180 seconds and an 8,000 pound air-conditioning unit was placed on top of the Associates Investment Building in South Bend, Indiana —six stories up!

This particular feat—achieved by Peter Schumacher Sons, Inc., general contractors and engineers—was amazing enough to the public so that it was televised and featured in the local newspaper. Yet CRANEMOBILE users know a CRANEMOBILE takes on jobs like this in stride!

High lifts are only one phase of a CRANEMOBILE'S work, for a CRANEMOBILE is a busy CONTRACTOR'S most versatile, most profitable piece of equipment. For lifting, loading, pouring and dozens of other work-projects a BAY CITY CRANEMOBILE'S power, smoothness of operation, ease of control, balance, and speed are paying dividends to owners everywhere. Call your dealer or write direct for illustrated catalog.



BAY CITY SHOVELS, INC. • BAY CITY, MICHIGAN

BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

264

PICTURE OF THE MONTH

Double Vision?

• The first slabs of black granite being set in the facade of an office building going up on New York City's Madison Ave. create the illusion of two crews, two scaffolds, and two Madison Aves. Actually, the view on the right is a reflection of the highly polished black stone. The eight-story C. I. T. Financial Corp. building is being faced completely with black granite—more of the stone than has ever been used before on a New York City building. New methods of cutting and polishing granite have sharply reduced its cost, thus making it economical to use in quantity. General contractor for the building is New York's George A. Fuller Co.

(Advertisement)

In place of wasteful and uncertain crankcase-oil changing based upon mileage or hours in service, many operators of heavy-duty construction equipment now use a better guide that saves them both time and money.

Now you can test used oil in minutes

IT HAS COME as something of a surprise to some maintenance men to discover that they have been throwing away hundreds of gallons of still-good oil . . . year after year. Conversely, it is quite a jolt to realize that a costly engine-repair job could have been prevented by an on-the-spot analysis that would have shown up the condition . . . in minutes!

The recommendations for oil changes issued by engine makers have always been computed on "averages" for the various classes of vehicle service. And like the "average" man on the insurance chart, the average vehicle doesn't exist in the actual fleet. For example, two bulldozers of the same make and model, operating on the same job, can have quite different patterns of oil economy and engine condition. Obviously no one set of rules can apply ideally to all units. And fortunately there is no longer any need for such generalization.

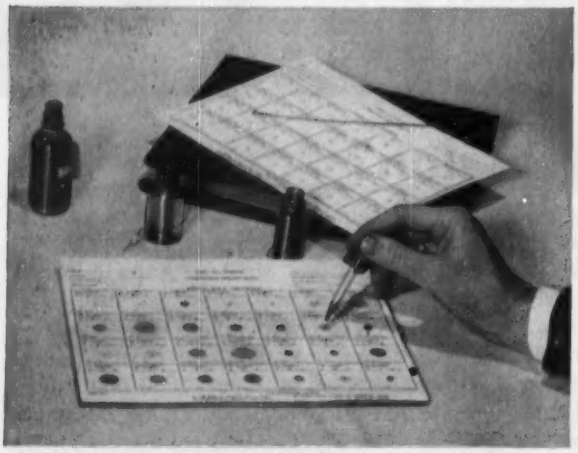
From a couple of drops of used oil, the Shell "ADC* Oilprint Analysis" provides a reliable check of oil condition, in minutes. It is very simple, and with a little practice, it tells you a lot about that oil and the engine that uses it.

What a drop of used oil shows: You place a drop of used oil on a piece of special filter paper supplied by Shell . . . let it stand a minute or two. You will then be able to *see* the following:

Water dilution: Even a tiny amount of water shows up . . . and that means not only that your oil is losing its ability to protect engine parts, but it also shows whether the water represents a normal amount of condensation or something more serious, such as an actual leakage of coolant from a faulty jacket.

Dispersancy/detergency: The same oil drop will give you a picture of how well the special additives in the oil are doing their job . . . whether or not the contaminants are being held in suspension where they do least harm . . . whether the cleansing and dispersing actions are adequate . . . whether the oil is still good.

Adulteration: The color of the oil spot will show whether too much contamination is occurring . . . and will very often point up the cause, indicating a check on



The simple test setup: sample bottles, a wire rod, a bottle of "indicator," and the permanent record card.

This single, on-the-spot sample reveals many things about an engine.

A fleet superintendent sees how easily the test is made.

injectors, nozzles, oil and air filters of diesels, or on plugs, carburetors and filters of gasoline engines.

All of the above can be learned from the single drop of oil . . . in an amazingly short time.

Alkalinity: Engine wear and engine deposits increase as the oil becomes acidic in nature due to contamination from combustion products. A special indicating fluid, developed in Shell Laboratories, tells at a glance whether oil is alkaline and still usable, or acid *and how much.*

Operators who keep an ADC Oilprint Analysis record of each vehicle generally find that the crankcase oil stands up longer than they had figured . . . a distinct saving in lubrication cost. At the same time, there is a running check on each engine that often detects impending trouble before its correction becomes costly. In this respect, the Shell ADC Oilprint Analysis qualifies definitely as one of the valuable recent tools of preventive maintenance.

If you are concerned with extending the service of crankcase oil, and with avoiding the risk of using oils loaded with contaminants, we suggest that you have one of the Shell service engineers demonstrate ADC Oilprint Analysis for you.

*Trademark

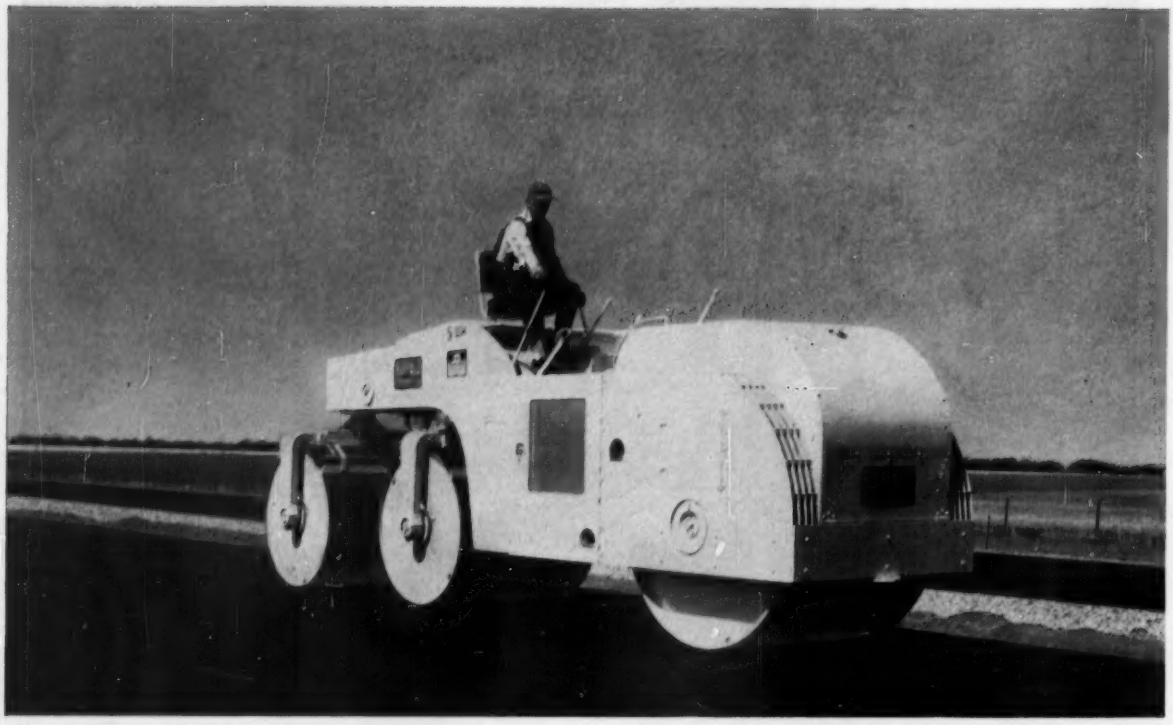
Photo shows an oil-spot test card...one phase in the visual life record of a charge of oil.

The Shell "indicator" shows acidity instantly. If spot turns red, oil is no longer fit to use, should be changed quickly.

SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

SHELL



"EASIEST HANDLING ROLLER" . . . says operator

as Buffalo-Springfield "Walking Beam" 3-Axle Tandem compacts Kansas Turnpike for San-Ore Construction

San-Ore Construction Co., McPherson, Kansas, used this Buffalo-Springfield Heavy-Duty "Walking Beam" 3-Axle Tandem Roller with *Complete Compaction Control* to get 99% specified densities on Sections 1 and 2 of the Kansas Turnpike.

Said Earl Robinson, operator: "We're finishing 2¾" asphalt down to 2½", and this roller is doing a beautiful job. There's plenty of power, and the synchronized hydraulic steering makes it the easiest handling roller I've ever run."

To which Charles Nickel, Superintendent, added: "This roller works and operates better than anything we have on the job."

Buffalo-Springfield's 3-Axle Tandem is *the best* 3-Axle Roller because its exclusive "Walking Beam" design and construction permits complete compaction control. There is never an increase in compaction pressure except when and where it is needed . . . on the high spots only! Then, through the "Walking Beam" semi-locked action almost *3 times* the normal compaction pressure of the center roll may be applied to the high spots, providing a leveling action unequalled by any other type 3-axle tandem roller. No need for added cross-rolling time and expense, and consequently no possible damage to material that has been compacted and set. Another feature of the "Walking Beam" action is that all rolls can be released for full floation whenever the leveling action is not desired.

Let your nearest Buffalo-Springfield distributor show you why anything *less* than a genuine Buffalo-Springfield 3-Axle Tandem with exclusive "Walking Beam" Compaction Control is old-fashioned! Ask or write for Bulletin No. S-71-1255.

BEAM, semi-locked. Lead guide roll can rise above but not go below its normal position.

FIRST guide roll encounters "hump" exerting only normal pressure, "prepares" material.

CENTER guide roll rises on "hump," lifts lead roll off ground, exerts triple normal weight.

DRIVE roll follows through with normal pressure. Beam can be locked and unlocked.

The Standard *of Comparison*

BUFFALO-SPRINGFIELD ROLLER COMPANY
SPRINGFIELD, OHIO

"Best for handling big rocks,"

says Cosmo Constr. Co., President

WHILE building an interchange to connect U. S. Highways 33 and 66 with the Oklahoma Turnpike near Tulsa, Cosmo Construction Co., Oklahoma City, ran into soft shale and clay, plus 12′ layers of drill-and-blast rock and solid limestone. In the deepest cut, which was 41′, excavation even uncovered a vein of coal.

To move these tough materials from deep cuts, Cosmo brought in 3 shovels, 4 crawlers, 2 graders (one an Adams), and three 22-ton capacity C Tournapull Rear-Dumps. The Rear-Dumps *profitably* handled *all* dirtmoving on this 400,000-yd. job.

Rear-Dumps take rock "beating"

Clay seams in layers of limestone created unforeseen difficulties, and contributed to making job exceedingly tough for Cosmo. The clay cushion took the "bite" out of dynamite blasts. So, extra blasting was necessary and fragmentation was poor. A crane, equipped with a ball, had to break the big, hard-to-handle rock fragments down to size for the dipper, so shovel operator could pile a good load into the Rear-Dumps.

Low rear-entry and 8′9″ wide-bowl made Rear-Dumps an easy target for fast shovel-loading. Triple-layer, all-steel floor of Rear-Dump body was particularly important on this job, because it could safely withstand pounding of heavy big-chunk rocks dropped by shovel.

"Right equipment can lick any job"

Rear-Dumps' ability to travel fast, at speeds up to 32 mph, was a big asset in speeding hauls. Although hauling conditions were tough, these Rear-Dumps continuously maintained good production. For instance, working a ½-mile cycle, they hauled about 1500 cu. yds. of coarse, blasted material per day out of one 34′ cut. According to Cosmo President, Clyde L. Ottinger, "LeTourneau-Westinghouse Rear-Dumps are best there are for handling large rocks and for long hauls." He added, "Good supervisors and the right kind of equipment can lick any job." Cosmo seems to have plenty of both!

Rear-Dumps . . . good heavy-duty haulers

For those big hauling jobs ahead, investigate Tournapull Rear-Dumps. They're top production haulers that can work profitably in rugged terrain or adverse weather conditions to give you more daily work output. Available in 3 sizes to fit your particular jobs: 11, 22, and 35-ton models. Write for details on these outstanding heavy-duty haulers.

Front-wheel drive and big 4-wheel air brakes let operator back Tournapull Rear-Dump safely to edge of dump area. Finger-tip switch activates electric hoist motor that raises and lowers body under positive 2-way control. As bowl swings below and behind rear wheels, to 66° dumping angle, it unloads rocks safely . . . prevents load from rolling forward against wheels.

Wide bowl provides easy target for shovel operator . . . speeds up shovel-loading and greatly reduces spillage. Low rear-entry into bowl lets shovel swing in and out at low dumping heights, also permits loading big boulders from dipper top with minimum effort or danger.

Adams—Trademark, Tournapull — Trademark Reg. U. S. Pat. Off. CR-1656-RA

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

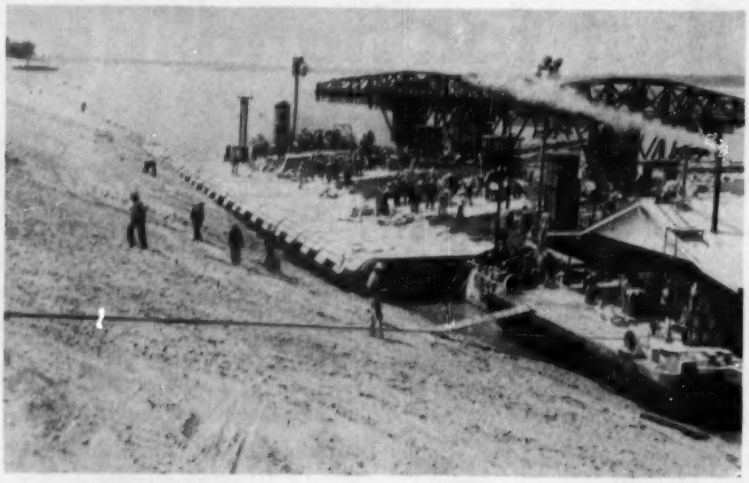
ARBA

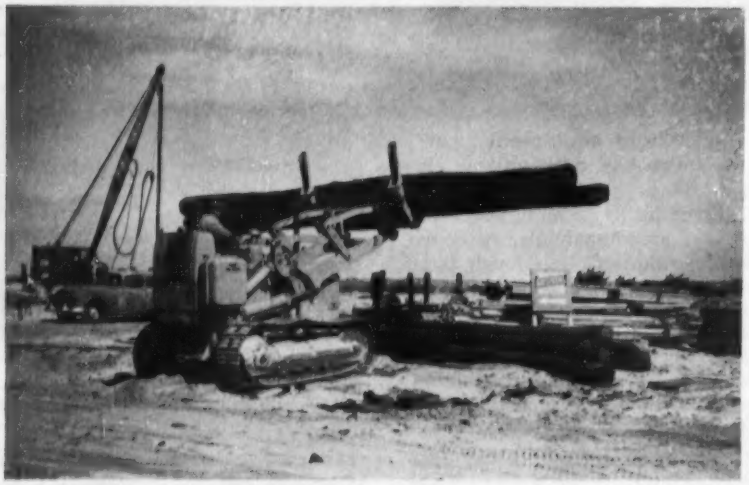
See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

Construction News in Pictures . . .

Calming a River

The Mississippi River is a meandering stream. To stabilize it at locations where navigation is threatened, the Corps of Engineers is placing concrete revetments or mattresses. After the banks are graded, a "matboat" uses its three big traveling gantries to place a continuous mattress from the top of the bank to the deepest part of the river—the distance varies from 300 to 600 ft. Over 4,000 4x25-ft mats can be placed in a 20-hr day.





Distributes Piling

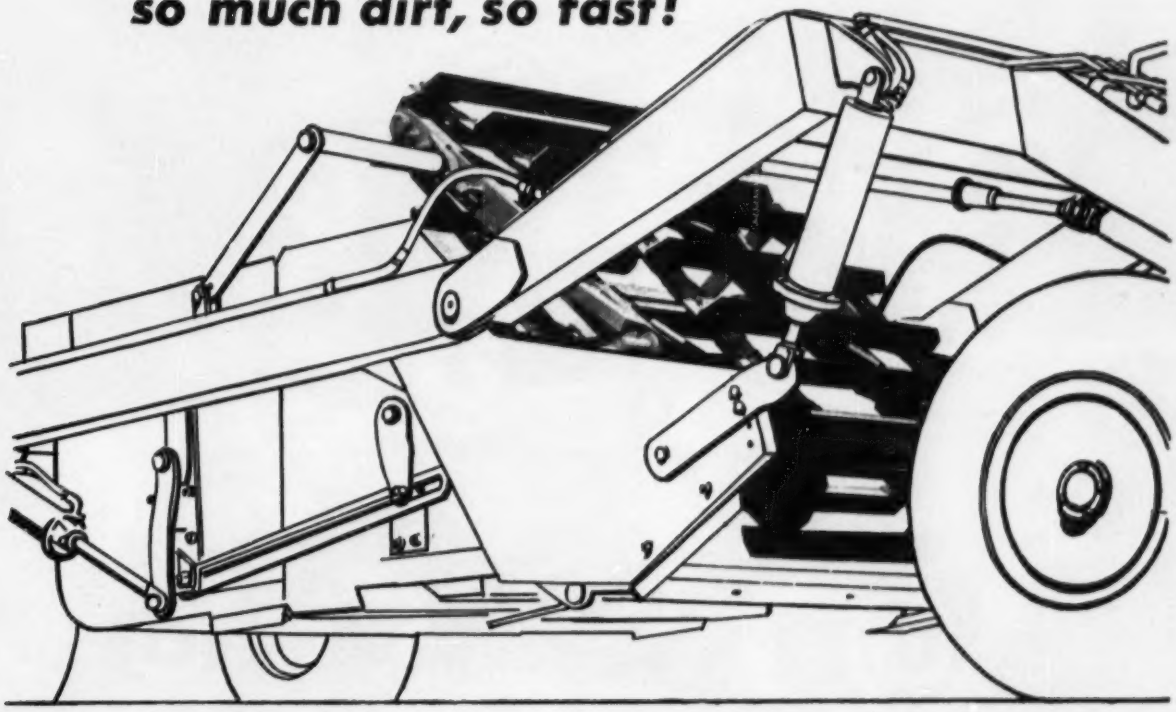
A Caterpillar No. 955 Traxcavator, equipped with a new log and lumber fork attachment that replaces the standard bucket, is being used to distribute creosoted piling from the store yard to the hammer. The Traxcavator is operated by Auserehl & Son Contracting Corp of Jamaica, N.Y., who are turning a swampy area at Suffolk City, N.Y. into an extension of the Sunken Meadow State Park. The Traxcavator lifts five 1,000-lb creosoted pilings per load.

Northwest Pipeline

Pushing 26-in. line through Pacific Northwest mountains, the River Construction Co. uses TD-18's with Carco winches to lower welding truck and boom tractor down 50% grade. The Fort Worth contractor's section extends through rough country from Chehalis to Ft. Lewis, Wash. When completed, the pipeline will carry natural gas from the San Juan basin area in Colorado and New Mexico to industrial areas in the Pacific Northwest, a distance of 1,481 mi.

because of **Hancock's** *elevator,*

No other Scraper can move so much dirt, so fast!



Yet the HANCOCK Elevating Scraper costs much less * than other Scrapers of equal capacity!

LOADS...

TRANSPORTS...

SPREADS...

200 YARDS...

With the elevator continually removing the dirt from around the cutting blade and distributing it evenly throughout the scraper, you get a balanced load at all times. This results in faster cutting, fast load transportation, maneuverability, and low power requirement. None of the blades' cutting capacity is sacrificed to push the dirt back into the scraper. The Hancock 11 yard Elevating Scraper is hydraulically controlled, works efficiently with any tractor of 75 horsepower or over and turns in only 28 feet.

*Less than ½ the cost of some models.

HANCOCK

Write, wire, or phone HANCOCK MANUFACTURING COMPANY, — PORTER 3-8297 LUBBOCK, TEXAS

How many yards per hour?

PAYLOADER® "more yardage" features

Balanced - four-wheel-drive, torque-converter and exclusive power-transfer differentials give more effective traction on mud, gravel, ice and snow for more reliable crowding power. Coupled with this crowding power is the unusual pry-out action and 40° tip-back of the bucket at ground level to get full bucket loads with less spillage loss. The result is that a "PAYLOADER" can

dig more

The 40° tip-back of the bucket at ground level permits a carry position that is close and low for maximum stability and with bucket opening almost level to prevent spillage of heaped loads. Hydraulic system shock absorber cushions the loaded bucket while carrying, smooths the ride and allows higher carrying speeds with less spillage. These features enable a "PAYLOADER" to

carry more

It's the yards delivered that count on any job and that's where a "PAYLOADER" really pays off. It gets more load in the bucket with less spillage to begin with — it can carry at higher speeds with less spillage — it can maneuver faster because the power-shift transmission requires no stopping for ANY shift. All these advantages enable "PAYLOADER" tractor-shovels to

deliver more

More yards on any job!

No one knows better than you that a rubber tired tractor-shovel can do so many jobs, under so many kinds of job conditions, that the yardage handled can vary considerably. That's why yardage figures can be so misleading unless all the factors are taken into consideration . . . kind of material . . . whether in-place or rehandling . . . operator efficiency . . . length of haul . . . waiting time for trucks . . . one location or scattered jobs, and many other variables that affect daily output.

But of this you can be certain . . . on any given job the new "PAYLOADER" tractor-shovels will deliver more yards per day than any comparable size tractor-shovel . . . and will do so continuously shift after shift.

The knowledge and experience gained in building thousands of tractor-shovels over the past 30 years is your assurance that a "PAYLOADER" is superior in design, engineering and performance . . . that it will outperform and outproduce any other comparable unit on any job.

So don't be deceived by "box-car" yardage figures . . . take a close look at the "PAYLOADER" . . . on *your* job . . . and you be the judge. Your "PAYLOADER" distributor will be happy to arrange a demonstration at your convenience.

THE FRANK G. HOUGH CO.
706 Sunnyside Ave., Libertyville, Ill.

Send data on 4-wheel-drive "PAYLOADER" tractor-shovels as checked

- ☐ HO (2¼ yd. payload, 1¾ yd. struck)
- ☐ HH (1¾ yd. payload, 1-1/3 yd. struck)
- ☐ HU (1-1/3 yd. payload, 1 yd. struck)

Name_____
Title_____
Company_____
Street_____
City_____
State_____ 7

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

C&D Movall-- Lets You Dump or Spread the Way You Want

FEEDS LIMESTONE INTO HOPPER at controlled rate for Cia. Peruna de Cemento Portland, Atacongo, Peru. Operator controls discharge rate from tractor seat, stops ejector when 8-yard crusher is full. Here two 25-yard Movalls, powered by Cat DW20 tractors, replace six 8-yard side-dump trucks.

SPREADS PERVIOUS FILL IN 18" LIFTS at Santa Felicia Dam in California. Movall dumps behind wagon tires, safely at any speed tractor can travel because dozer-type ejector keeps center of gravity low. Depth of spread is uniform, controlled by speed of tractor (4" at 20 mph., 18" at 3 mph.). Movalls also can dump while turning at end of road fill, thus retaining fines on top.

DUMPS OVER EDGE OF FILL with tractor either straight ahead or jackknifed. Drive wheels are always on good footing; center of gravity stays low. Positive ejection with 140,000-lb. push enables Orlando Construction Co., to dump 25-yard load of rock and dirt in 12-14 seconds on Massachusetts Turnpike. Movalls dump cleanly and quickly any material you can top load.

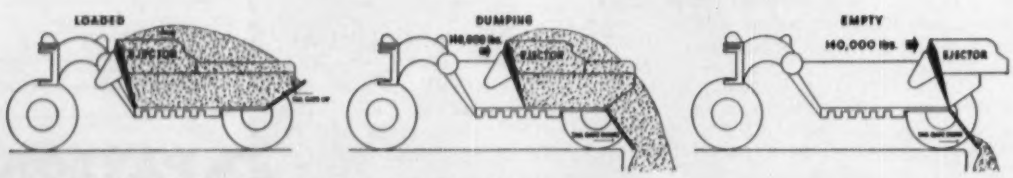
DUMPS ON GRADE safely from any position or on any level. Load is pushed straight back by 140,000-lb. push of dozer-type ejector. There's no raising of load, no danger of wagon tipping or damaging mechanism. Frozen earth and rock being dumped here on St. Lawrence Seaway by C. A. Pitts, Ltd., was loaded by 6-yard shovel.

Movalls are available for all rubber-tired tractors—Allis-Chalmers, Caterpillar, Euclid, International, LeTourneau, M-R-S, and Wooldridge. Sizes: 12 to 26½ cu. yds. struck, 22 to 45 tons rated load.

Buy Movalls where you buy your tractor... ask for a demonstration on our buy-and-try plan. C & D Division, Yuba Manufacturing Co., 701 East H St., Benicia, Calif. Phone 628.

9-R

HOW IT WORKS



Construction Methods AND EQUIPMENT

DECEMBER, 1956

VOLUME 38 • NUMBER 12

HENRY T. PEREZ, Editor

Merry Christmas

and

Happy New Year

WE SALUTE construction men all over the world this Yuletide season for the contributions each of you has made to this year of record accomplishment. Your splendid efforts again in 1956 have made possible increased prosperity and better living for millions of people at home and in distant places.

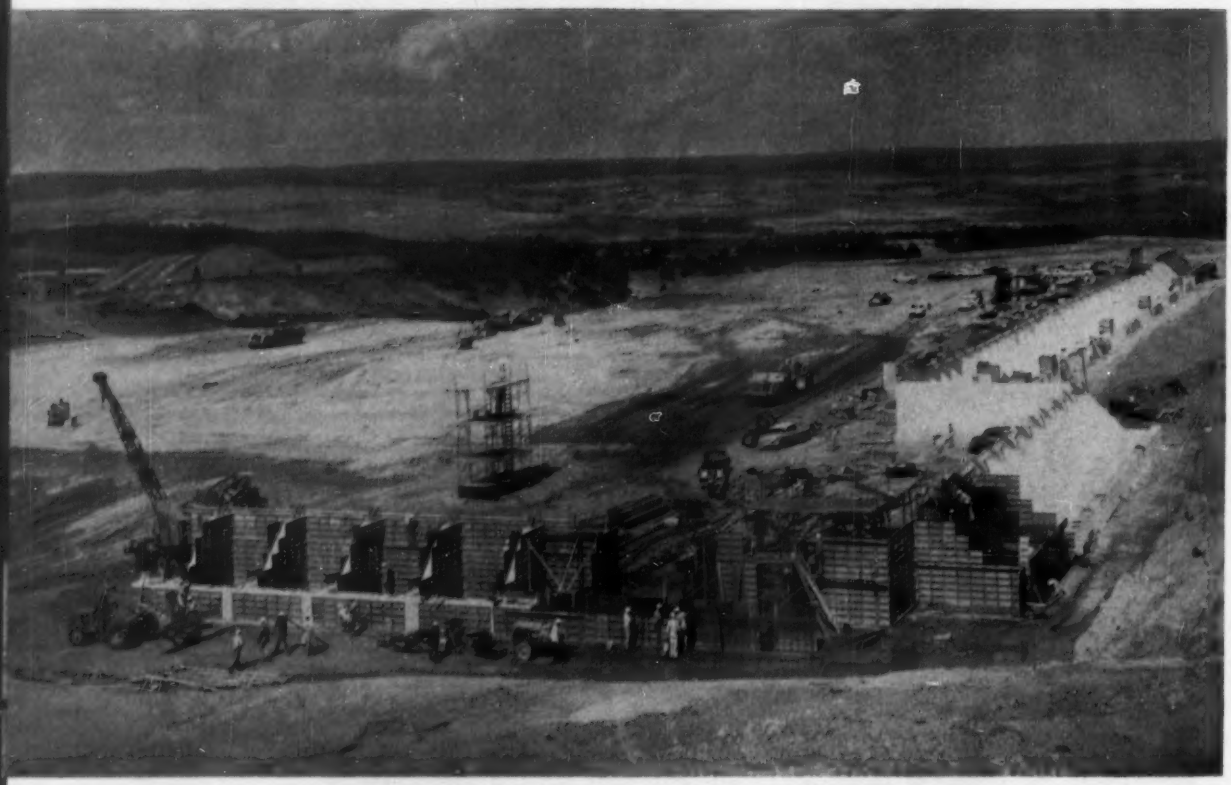
It is a source of rich personal satisfaction to be part of an industry so uniquely devoted to providing the means for fuller, happier lives for all men. And it is gratifying that all signs point to still greater opportunities for service during 1957.

The new national highway program already off to a fast start, will hit an increasing tempo. Nearly $3¼ billion in roadbuilding contracts will be awarded. Almost all other types of construction similarly will reach new highs.

Unhappily, so will construction costs. The price of money is going up and so is the price of labor. Equipment and materials will cost more. Some will be in short supply.

But while equipment will be more expensive, it will produce more. And new machines and improved models being introduced and displayed at next month's Road Show in Chicago will help keep construction costs from rising even higher. In addition, contractor ingenuity in devising new construction methods will continue to enable us to build better, faster, and more economically.

So to all of you who share our pride in the construction industry's past accomplishments and our confidence in its future, we send our best wishes for a Merry Christmas and a Happy New Year.

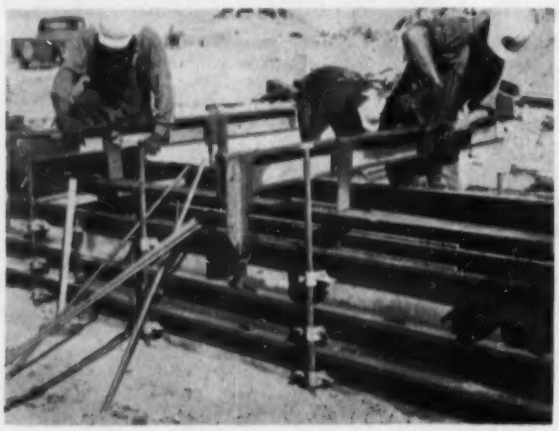


Retaining walls at Air Force Academy are contractor's proving ground for . . .

New Ways With Wall Pours

THE SITE of the new U. S. Air Force Academy, in the foothills of the Rocky Mountains' Rampart Range near Colorado Springs, is a magnificent one. It is also a challenge to the contractor. For topography dictates both split-level campus and academic buildings that require nearly 2 mi of heavy concrete retaining walls up to 33 ft high.

To build these—and at a rate of 70 lin ft of wall daily—Denver's Long Construction Co. has combined standard items with various job - devised time - saving techniques. For example, Symons steel-framed plywood panel forms



FOOTING FORM, made from superimposed curb forms, is held by combination spreader-tie that also suspends wood form for keyway.

FOOTING POUR is made by chuting concrete directly into form from transit-mix delivery trucks. Footing will be water cured.

are aligned by telescopic aluminum pipe braces (cover photo) designed by Superintendent Arnold Gaunt. And standard form ties have their ends painted separate colors for quick and unmistakable identification of different lengths.

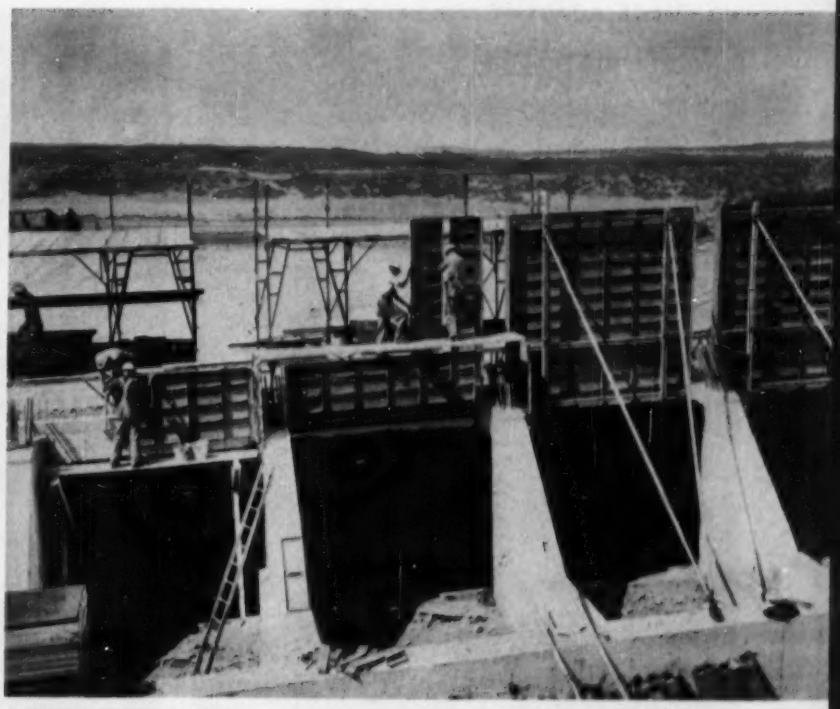
The retaining walls are 10 in. wide at the top, have a plumb rear face, and are battered ¼ in. to the ft on the front face. Of the total 10,000 lin ft of wall, 80% is a counterfort design from 15½ to 33½ ft high. It sits on a 21-in. deep footing 4 to 13 ft wide. Counterforts 18 in. wide and on 14-ft centers connect the main wall with an anchor wall some 18 ft to the rear. This anchor wall, 2 ft wide and 4½ ft high, sits on its own 21-in. by 5-ft footing.

Curb Forms For Footings

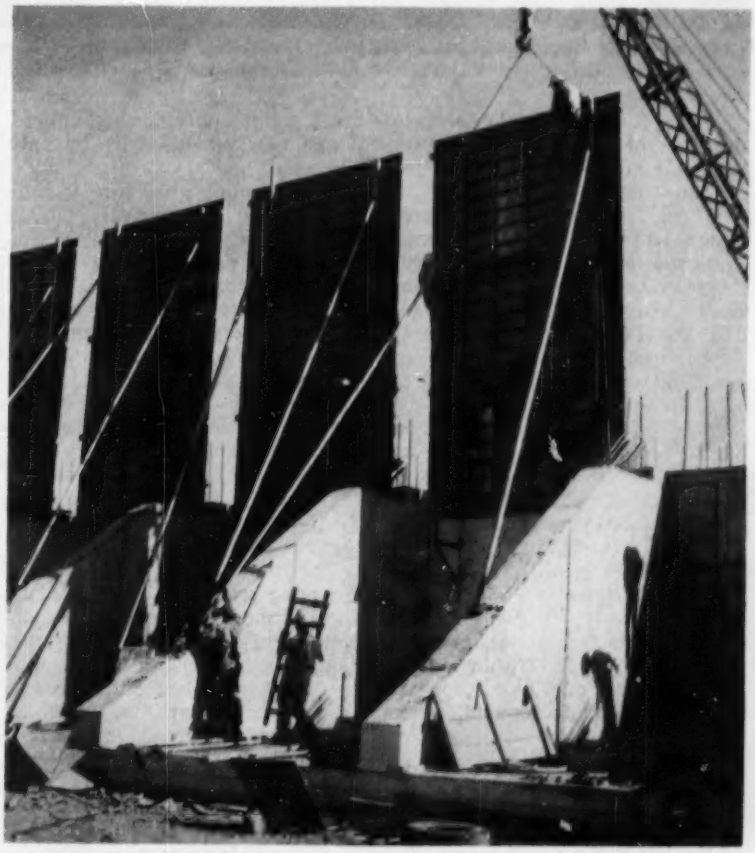
On compacted subgrade, Long forms the footings for main and anchor wall out of old steel 4- to 8-in. curb forms they had kicking around their yard. Because most footings are 21 in. deep, sets of 6- 7- and 8-in. superimposed curb forms are pinned to the subgrade to hold the concrete. But form pins alone are not strong enough to make the units secure. So Long rejiggered other curb-form components to act as combination form spreader, form tie, and hanger for 2x6-in. timber that molds a keyway slot between wall and footing.

For this device, a smaller curb-form channel is slipped within a larger one so the unit is adjustable for footing width. Steel strap hangers, which suspend the keyway form, ride the flanges of the transverse combination units and can be fixed in place by simply tightening a bolt between friction plates. The unit itself is held to the side forms and at the correct height above them by vertical angle clips on either side, fitted with a lip and cam at the lower end. Thus the unit can quickly be fixed to the top flange of the curb forms that make the side of the footings. The clip and cam hold the forms securely so they can move neither in nor out.

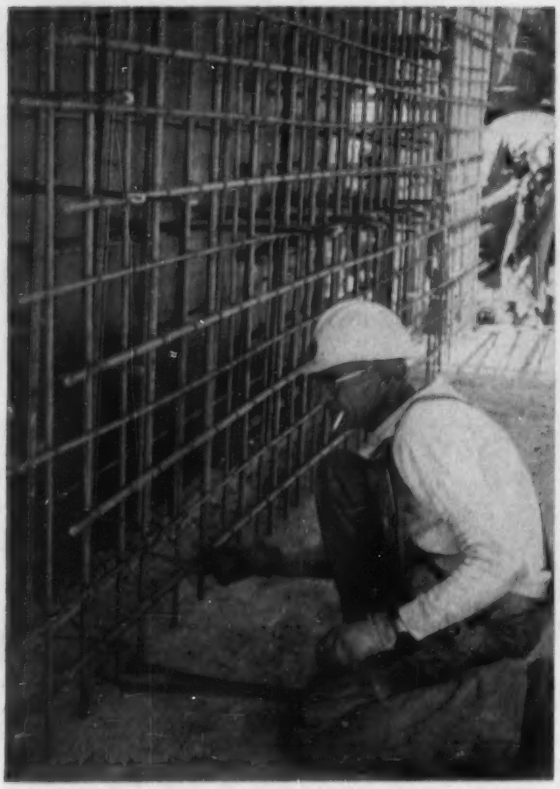
Forms for the other sections of the retaining walls are Symons Steel-Ply units, usually in 2x8-ft panels, weighing but 5 lb per sq ft. They consist of plastic-faced plywood inset in a steel frame only 2½ in. thick. Because the steel frame completely encloses and protects the edges of the plywood face, the forms have long life—Long is forming 600,000 sq ft of wall with



EARLIER METHOD of forming counterfort walls was to set rear face panels individually, apply wales and strongbacks, then set up aluminum struts to brace them to previous pour.



IMPROVED METHOD of forming rear face of upper wall involves pre-assemblies of panels, which are set by crane. Assemblies are usually six panels wide and two high (11½x16 ft)



THROUGH-WALL TIES are placed from face after rear forms and reinforcing have been set. Individual face-form panels swabbed with

Protex form oil will be set next. Ties, with ends painted to differentiate lengths, are kept in boxes and inverted forms.

37,000 sq ft of forms and expects to use the panels repeatedly after their Air Force Academy wall job is completed.

Where practicable, the panel forms are pre-assembled into large units that can be placed by crane. These units generally are two panels high and six wide to make a 16x11½-ft assembly. Double 2x4-in. horizontal wales near top, center, and bottom strengthen the unit. In addition, Long fits the assembly with two double 2x4-in. vertical strongbacks.

Each strongback, near its upper end, is braced by an aluminum raker. The brace extends to a Superior tilt-up insert cast in the anchor wall for a low-wall pour or into the lower part of the counterfort for a high-wall pour. Long had the braces fabricated of standard aluminum alloy pipe. Within a 12-ft center section of 2½-in. pipe are telescoped 2-in. dia top and bottom extensions that give minimum and maximum elongations of 16 and 28 ft. Pinned holes on 6-in. centers give coarse adjustment, while a trench jack built into the lower end of the brace can put the form "on the money." Because the aluminum brace weighs only 68 lb complete, it can be handled easily by only one man.

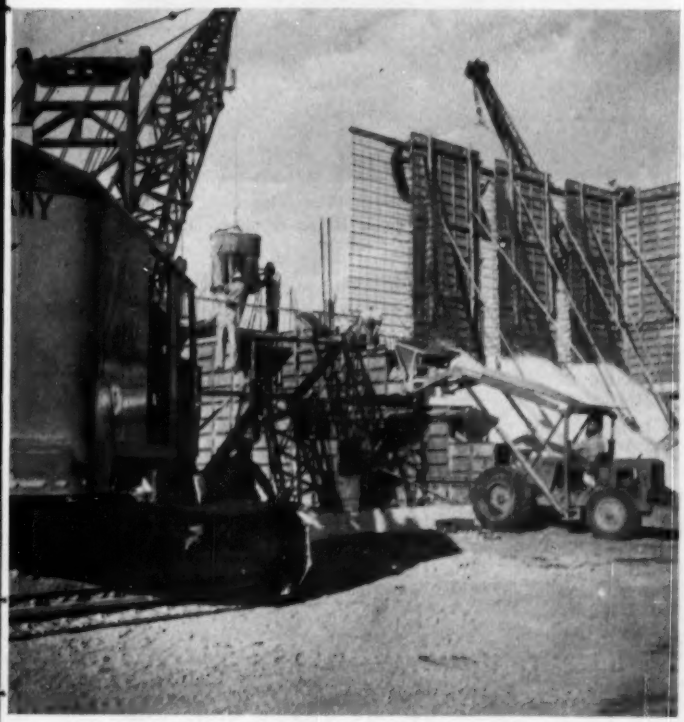
Wall forming procedure is simple. For an upper wall pour, a crane swings into position an 11½x16-ft pre-assembled section of panels for the back wall form. The assembly is hitched to a set of panels left in place from the lower wall pours, and aluminum pipe braces already attached to the assembly are run out to previously set inserts. With the rear section thus secured, a prefabricated mat of reinforcing steel is placed and tied. Then individual Steel-Ply form panels are laid up to make the front face of the wall.

The front panels are placed from traveling scaffolds that ride along the subgrade. They consist of American farm wagons (whose axles Long widened for increased stability, and whose chassis they trussed for greater strength) on which are mounted two or three 10x20-ft platforms carried by panel-type scaffolding. Platforms are 8 ft apart vertically. This lets carpenters set, and later strip, one line of 8-ft high forms from each platform.

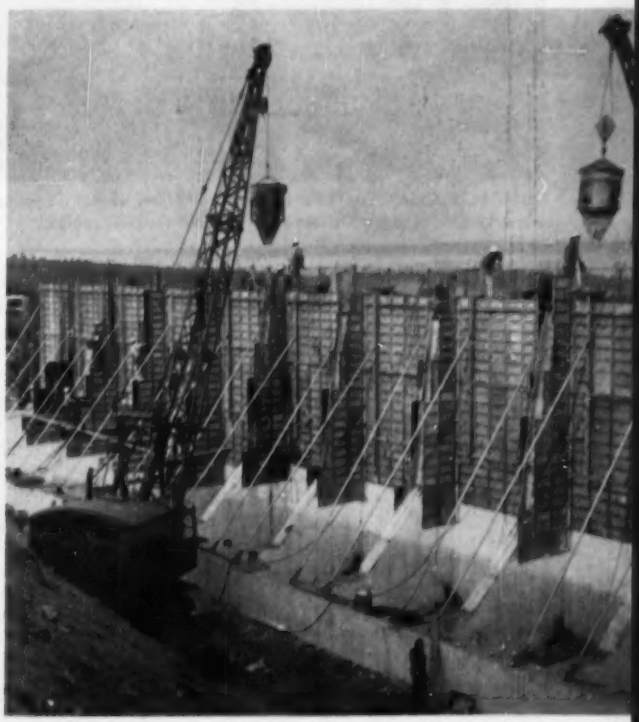
Forms are held by fabricated break-back ties. These are spaced 2 ft on centers horizontally (at form panel joints) and on 1-ft centers vertically. Because the wall batters ¼ in. per ft, tie lengths change in ¼-in. increments. This difference is mighty small for the eye to distinguish unaided. So, to make identification simple, Long paints the ends different colors as soon as the ties are unpackaged. One set of eight colors serves for each level of form panels (that is, the bottom tie of each panel is one color, the second another, etc.). That's because with 8-ft high forms there is a 2-in. difference in corresponding tie lengths, panel to panel, and that difference is readily discernible.

Counterforts 18 in. wide brace the wall on 14-ft centers. Bullnoze 6-in. magnesium forms make the corners between rear wall and counterfort forms. Early in the job, Long used only standard 2-ft wide panels to form the front face of the wall. Because these did not correspond to the 30-in. rear forming (two 6-in. corners plus 18-in. counterfort) there could be no through ties to hold the panels. Instead, an extensive waler system had to be substituted at these points. Then

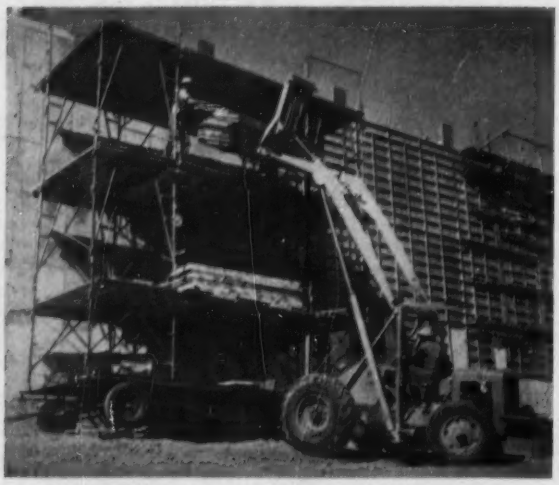
FRONT-END LOADERS fitted with ½-yd hoppers handle lower wall pours. Hydraulically powered rear-wheel steering lets handy Eco-nomobiles maneuver readily in tight places. Hopper gate, too, is hydraulically controlled, so no extra man is needed to dump.



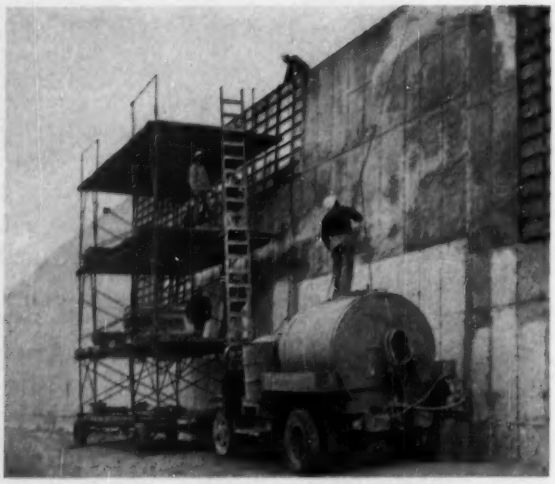
LOADER AND CRANE make counterfort pour. At rear, self-propelled crane sets pre-assembled mat of reinforcing for upper wall.



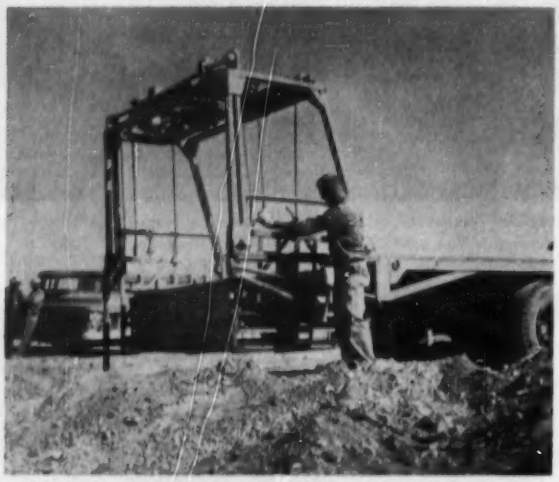
CRANES ALONE pour upper wall. Aluminum form braces are so light and strong they don't deflect under own weight, even at 28 ft.



STRIPPED FORMS are removed by loader, which has maximum reach of 22 ft. Converted farm wagon makes handy rolling scaffold.



STRIPPED WALL is sprayed with Techkote curing compound. Truck also carries 1,000-gal tank for water curing where required.



CONCRETE CHAIRS to hold footing reinforcing above subgrade are unloaded by Superlite device driven by gasoline engine.

REINFORCING STEEL is handled by Trackson swing crane on International TD-9 in places where going is too rough for fork lift.

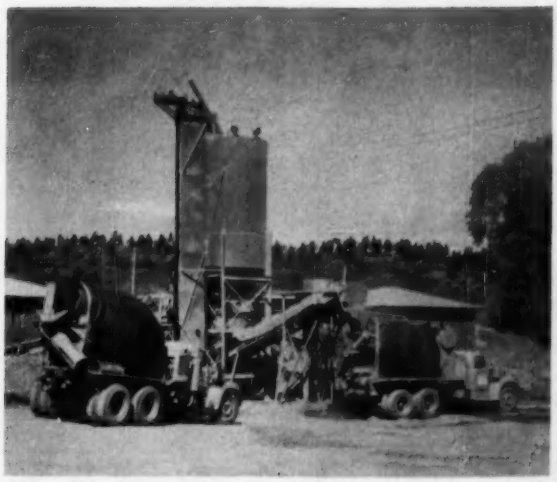
Long had Symons make up some 30-in. wide panels to be inset in the wall face opposite the counterforts. Now these panels can be placed readily and without extra bracing after the adjoining larger pre-assembled form units are set.

Ordinarily the high walls are concreted in three pours, each 70 ft long: footings; anchor wall and lower 13 ft of wall and counterfort; upper parts of wall and counterfort. One pour of each type is completed daily. Concrete, which totals some 24,000 cu yd, is a 3,000-psi 5-sack mix with a 7.2 water-cement ratio and 1½-in. maximum aggregate. Darex admixture entrains 4 to 4½% air, and 1½ lb of Pozzolith is added per yd as a set retardant. Slump is 3 to 4 in. in wall pours, 2 to 3 in. elsewhere.

General Concrete Co., a commercial supplier who set up a batch plant on the site, furnishes Long with transit-mixed concrete. For footing pours, General's 6-yd Jaeger and 6½-yd Challenge mixers on International R190 and Mack B63 trucks discharge directly into the forms. For wall and counterfort pours up to 18 ft high, the transmit mixers feed crane-handled buckets and ½-yd hoppers on Econmobile front-end loaders. Higher wall pours are handled by a self-propelled Lorain SP254 crane with ⅝-yd Gar-Bro bucket and a Northwest No. 6 with 1 1/3-yd Insley bucket.

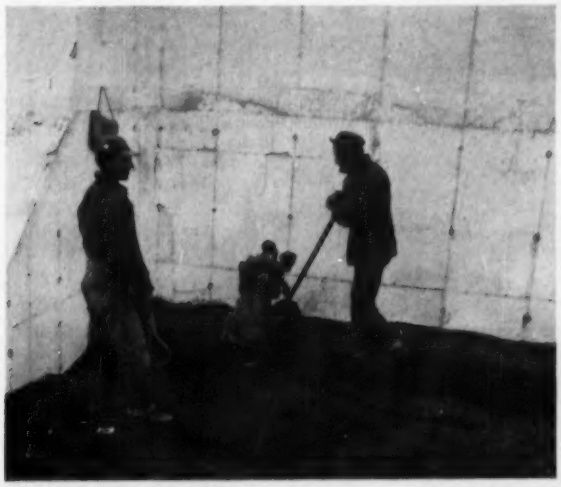
Superintendent Gaunt much prefers to pour with two of his three Econmobiles because he finds them faster than cranes. The relatively inexpensive machines are fitted with torque-converter drive, power steering, and self-adjusting arms that can keep the hopper attachment level at all times. The operator himself controls the hopper gate through a hydraulic ram. Because the hopper attachment is readily interchangeable with regular forks, Long uses the Econmobile for handling such things as form panels and reinforcing steel in addition to pouring concrete.

But regardless of how concrete gets to the wall forms, by crane or loader, it is discharged into 30x30-in. Gar-Bro hoppers fitted with 4x9-in. tremie trunks to limit the free fall to the specified maximum

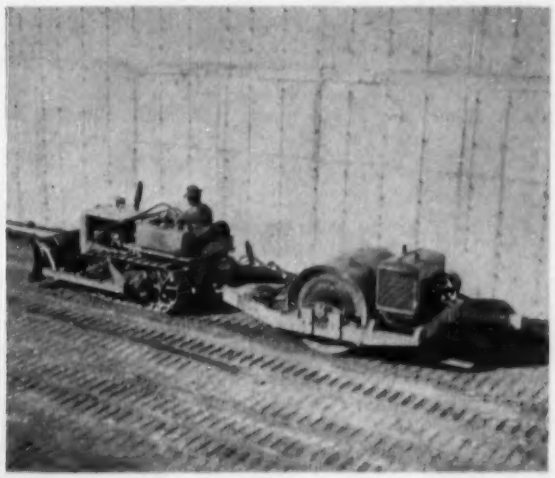


BATCH PLANT supplying concrete for retaining walls is push-button operated and loads transit-mix trucks by belt conveyor.

BACKFILL is spread behind wall by Euclid scraper. Earthmoving operations are not handled by Long but by other subcontractor.



COMPACTION of backfill in confined spaces such as right against concrete and in counterfort corners (above) is done with Jay vibrating tampers. Caterpillar tractor pulls Terrapac vibrating roller to compact fill at base of retaining wall's face.



of 5 ft. In the forms, concrete is consolidated by Dart and Maginniss high-cycle electric vibrators.

Vibration is especially important on the Air Force Academy job because of the quantity of reinforcing involved—it averages 166 lb per yd. In certain spots the steel is almost a solid mat. The 18-in. counterfort, for example must accommodate five No. 11 bars in one layer with two ½-in. bands, plus a ½-in. clear edge distance on either side. And where the sloping part of the counterfort intersects the 18-in. horizontal tie to the anchor wall, 13 No. 11 bars in three layers must mesh with 15 No. 10's.

Nevertheless, honeycombing is a rarity with Long. Nor is speed sacrificed—at least 70 ft of wall goes up each day. Best weekly pour to date (six 8-hr days) is 1,558 yd.

Because of the through-wall ties, all forms must be stripped in individual panels. Carpenters on the scaffold-wagon platforms readily and safely handle the face forms. At the rear, however, where counterforts and anchor wall make wagon use impracticable, men must climb up the panels. To keep these stripper safe, Long devised a safety belt with a hook that slips through the steel frames of two abutting form panels to free both hands for working.

Immediately after stripping, the wall is sprayed with Techkote white-pigmented curing compound. Later, Long uses the backfill (while it is being placed and compacted behind the wall) as a rising platform from which to break off the snap-ties and point up the holes. Thus there is no need for scaffolding.

Long Construction Co., Denver and Kansas City, is building the 10,000 ft of retaining wall under subcontract from T. F. Scholes Inc., Reading, Pa. Jim Cullen is Long's divisional vice president in Denver, Joe Crawford is project manager, and Arnold Gaunt is general superintendent.

The Air Force Academy Construction Agency, of which Col. Albert E. Stoltz is director, is in over-all charge of the work. John O. Merrill is resident partner for the architect-engineer, Skidmore, Owings & Merrill of Chicago.

CONTROL SHAFTS in the outlet work at Oahe Dam are perpendicular to the flood control tunnels at their midpoints. The six shafts (only three shown in photo) each handle a gate to regulate the flow through one of the flood control tunnels.

Tractor Digs Vertical Shafts

A SMALL TRACTOR, tethered to a post, cuts control shafts 205 ft deep and exactly 38 ft in dia at the outlet works of Oahe Dam on the Missouri River near Pierre, S.D.

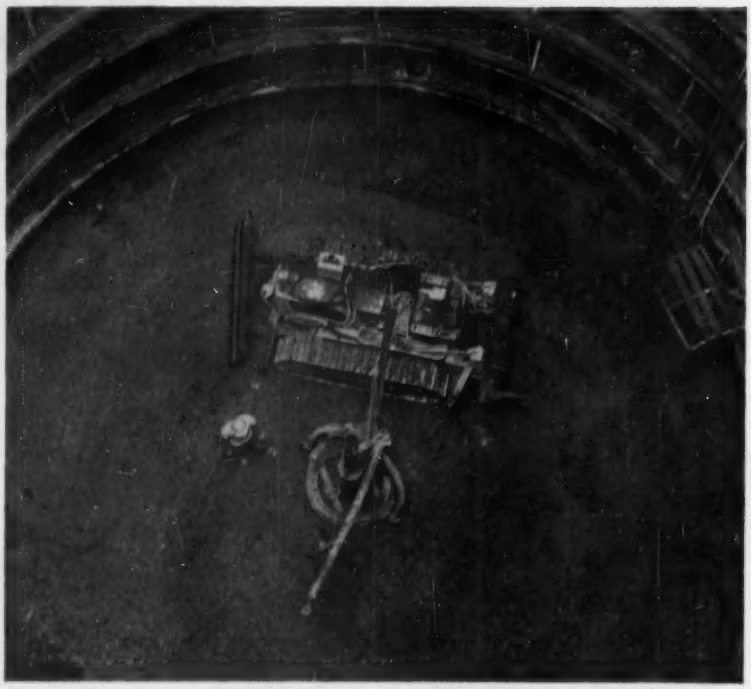
The vertical shafts will handle gates at the midpoints of the six 3,500-ft flood control tunnels. The idea of harnessing a small Oliver tractor to dig the shafts belongs to Oahe Constructors, a joint venture of five firms that holds a $4.6 million contract for the job.

The method is simple, fast, and efficient. With an auger, the contractor bores a hole 15 ft deep and 12 in. in dia at the center of the shaft. In this, he sets a length of 12-in. pipe, 1 in. thick in its wall section.

Guiding the Tractor

A heavily constructed yoke, designed to revolve freely, fits over the pipe. From the yoke run two booms of heavy 4-in. pipe. Eyes in the ends of the booms engage fasteners welded to the frame at the front and rear of the tractor.

This arrangement serves as a tether to hold the tractor in exact



TRACTOR with dozer blade in front and ripper at the rear circles center post to dig shaft. Here it works free, but when it is yoked to post, it cuts exact shaft bore.

position. When the tractor goes into action, it moves around the center post, cutting a path that is the exact diameter of the control shaft. The fastening units that hold the tractor to the tether can be disconnected easily so that it can work the entire area of the shaft. The tractor mounts a dozer blade in front and a ripper in the rear.

In the first of the six shafts that Oahe Constructors will dig this way, it was necessary to remove material piled up by the tractor with a clamshell because the tunnel that the shaft will intercept had not yet been holed through.

Handling the Muck

But in the remaining shafts, the tractor will handle removal of spoil, too. Work on these shafts will not begin until the tunnels have been finished.

The plan is simply to bore a 36-in. glory hole with a churn drill down to the tunnel below. The glory hole will be off center so as not to interfere with the placing of the center post for the tether. The tractor will shove loosened material into the glory hole and down into the tunnel where it will be caught on a conveyor and removed through the mouth of the tunnel.

Protecting the Shale

The shafts are cut through a Pierre shale formation, and the shale must be Gunited to keep it from drying out and breaking up as the shafts go deeper. In addition, ring beams are set every 4 ft in the shafts, and mesh and blocking are placed behind the beams to hold the shale in place. Concreting of the shaft lining must be carried out from the bottom up so it cannot begin until excavation is completed.

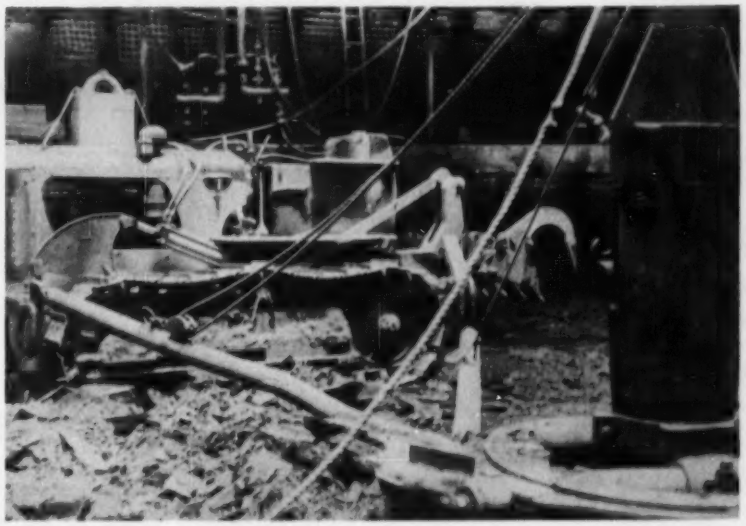
Running the Job

Oahe Constructors is a combine of Foley Bros., Inc., St. Paul; Winston Bros. Co., Minneapolis; Donovan Construction Co., Minneapolis; C. F. Lytle Co., Sioux City, Ia.; and Missouri Valley Constructors, Inc., Leavenworth, Kans.

George Lindquist is project manager for Oahe Constructors; Bob Hoover is assistant project manager; and George Lyle is superintendent.

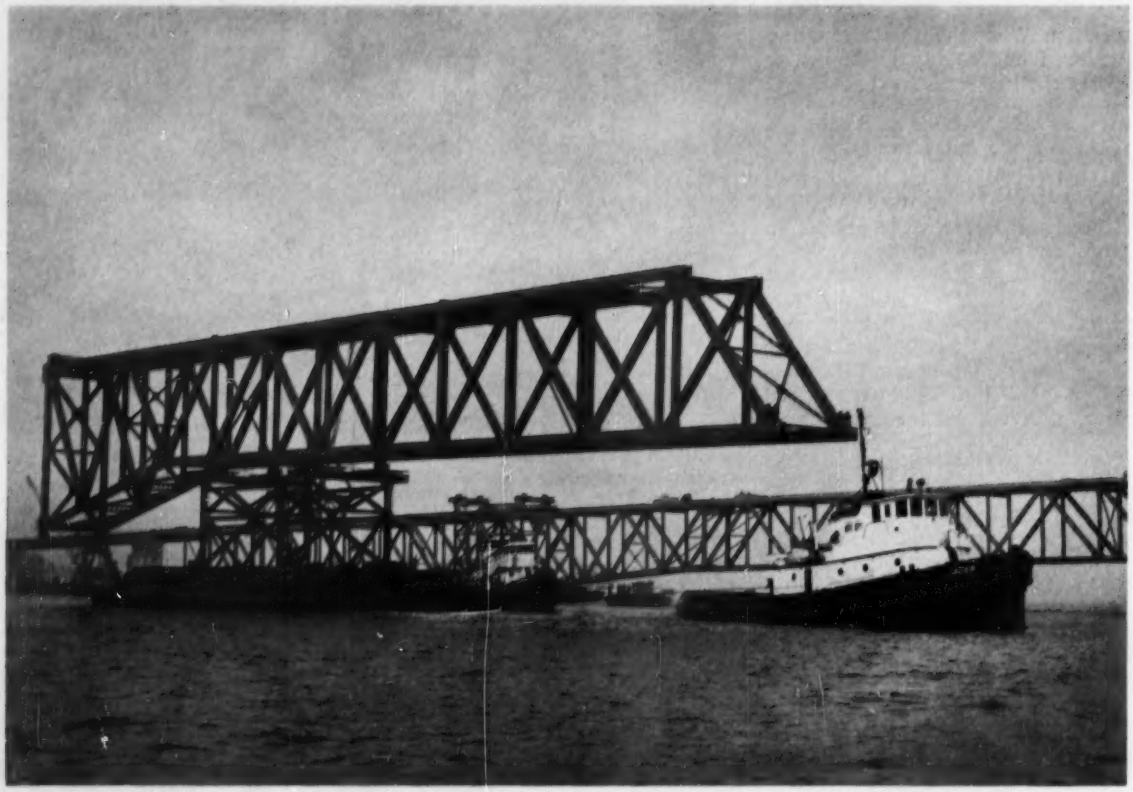
Oahe Dam is under the supervision of the Omaha District of the Corps of Engineers, Col. Thomas J. Hayes, district engineer. A. F. Arrington is resident engineer at Oahe.

COLLAR with semi-circular clevis supporting two booms revolves around the center post. Booms fasten to front and rear of crawler tactor, guiding it in an accurate circle.



EYE OF BOOM engages fitting welded to frame of tractor. A removable pin disconnects easily so tractor may be unhooked from its tether to work entire shaft area.

COVER over control shaft rides back and forth on rails to provide easy access to the shaft and to make it possible for work to continue during South Dakota's rugged winter.



LONG SPAN mounted on falsework above two barges is towed across Virginia's Rappahannock River. All spans are assembled on barges alongside bridge near south shore.

Landing Span on Cantilever Arm

HUNG-SPAN DESIGN of Virginia's Rappahannock River Bridge offers some interesting problems to Bethlehem Steel Co.'s experts on floating-in erection.

Instead of following the conventional method of landing an assembled span on two piers, crews must first set one end on a pier and then maneuver the other end into a hanger on the cantilevered arm of the adjacent span. It requires precise control to prevent collisions of the two spans, and also some special devices for holding the truss and hanger long enough to drive an 8-in. dia pin.

The job calls for the assembly and floating-in of fourteen spans. The largest is 468 ft long and weighs 900 tons. The first span floated was 351 ft long and weighed 560 tons. It was assembled on a set of two barges by a 35-ton tower derrick boat. Maneuvered over two concrete piers, the span was landed by the conventional method of flooding the barges.

Erection Dock

Once in place, span 1 served as an erection dock. It now mounts a 35-ton traveling stiffleg derrick with a 100-ft boom and 6-ft jib. The derrick is supported on a gantry to provide extra height and also to allow deck paving crews to pass underneath.

The big gantry rides on rails supported by a heavy frame bolted to gusset plates of span 1. The frame is required because the top chords of the trusses cannot support the traveler.

Alongside span 1, all thirteen remaining trusses are assembled one at a time on barges. This is perhaps the first time spans have been assembled while floating. Generally, they are pieced together on pile-bent falsework and lifted by barges only when ready to be floated. Pile bents provide reliable support in heavy winds, but Bethlehem engineers figure they can eliminate bents at Rappahannock because tied-down barges can resist the wind that develops in that area.

Barges on which trusses are assembled are operated in sets of two. Smaller spans are floated on one set of barges and larger span on two. Barges are 128 ft. long, 32 ft wide, and 9½ ft deep. In a set, they are fixed 4½ ft apart by steel distributing beams that support falsework.

Falsework

To reduce the amount of rebuilding of falsework for each span, the lowest level spans are floated in first. In this way, there is practically no dismantling required to prepare falsework for the next span. A few pieces are added on top to increase the height, and the falsework is ready to be reused.

Determining the height of the falsework above water is a precise job. In fact, a detailed floating plan for each span is determined ahead by Bethlehem engineers. Following government tide tables, they determine a range of tides in which

BARGE ASSEMBLY maneuvers span into position on bridge. Far end is landed first on concrete piers. Near end then is pinned to hangers on cantilever arm of adjoining span.

Complicates Floating-In Erection

the field crew is permitted to float a span. They set up charts for each span which give the minimum tide below mean sea level at which the span can be floated in over piers and have a clearance of 3 in. They also give the highest tide at which the barge assembly can be sunk sufficiently for falsework to clear the bottom chord of the truss by two in. when the barges are submerged to a minimum freeboard of on ft 3 in. With this information, the field crew can determine the best time to float. If the wind velocity is low, and the tide permits them to complete the job in one day, they schedule a floating.

STIFFLEG DERRICK mounted on gantry rides atop first span and assembles all thirteen remaining spans alongside. Tower derrick in distance fills in dummy chord members.

Typical Span

Let's follow the complete assembly and floating cycle of a typical span. When a barge assembly is removed from under a floated span, it is moved back alongside span 1, the erection dock. Because of shallow water, tugs leave the barges several hundred ft from the erec-

FLOATING-IN ERECTION
Continued

tion dock, and the two 3-drum hoists on each set of barges take over. They pull on permanent anchor lines deployed in the area and maneuver the assembly into position. Here, it is tied and anchored strongly to prevent it from breaking away in a storm.

In a short time, the derrick atop the erection dock completes the adjusting of the falsework. All falsework members are stored right on the barge assembly for easy handling. Final adjustments in elevation are made with four 200-ton wedge jacks, one at each corner of the top of the falsework.

From this point on, conventional erection methods are followed to assemble the span. Heavy steel members are brought in on barges, fitted with hanging scaffolds, and hoisted in place. On large spans, the supporting barge assembly consists of two sets of independent barges. Steel is assembled on each set until both sections of the span are large enough to be united. It is sometimes quite tricky bringing independent floating units together with enough precision to make the connection between the trusses. But once the spans are united, the two sets of barges work as a team.

RAILS on which traveling gantry ride are mounted on heavy beams bolted to span's gusset plates. Top chords of truss are not strong enough to support load of gantry.

TUGS tow assembled span within few hundred feet of piers. Close positioning is done by 3-drum hoists mounted on barges and connected to anchor lines deployed over area.

Floating

As the span nears completion, Bethlehem's engineers begin to figure the best time for floating. Generally, they prefer to schedule it so that the span arrives over the anchor bolts at about the peak of high tide. In this way, there is minimum of vertical movement to harass crews during the close positioning. And there is the added advantage of a subsequent falling tide to help land the span.

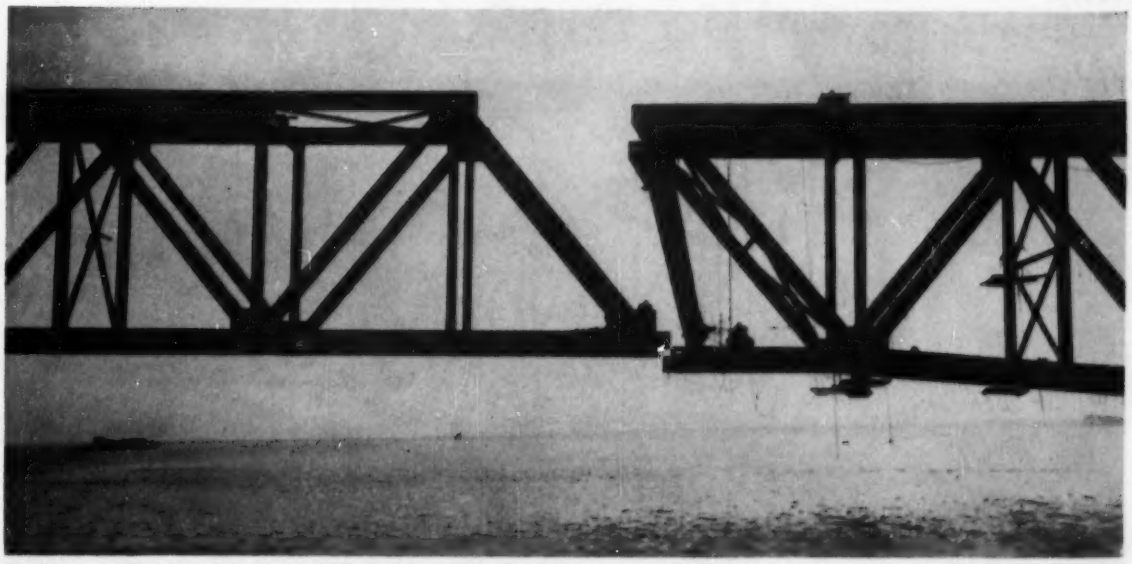
When the time arrives for the span to be moved away from the erection dock, hoists mounted on the barges pull the assembly over shallow water to a point where tugs can take over. Several changes in anchor lines are required to maneuver the barges across the long stretch of water to the tugs.

On the bigger spans, four tugs can handle the towing. Generally, two straddle the front set of barges and two straddle the rear set. When the assembly arrives at a point several hundred ft off the bridge, anchor lines are connected to the hoists. From each set of barges runs six 1-in. cables and two 2½-in. manilla ropes. Besides two lines to each pier, there are four anchored on the opposite side of the bridge for pulling and four anchored on the opposite side of the barge assembly for slackening off. To provide additional control, tugs are deployed to handle lines in four directions.

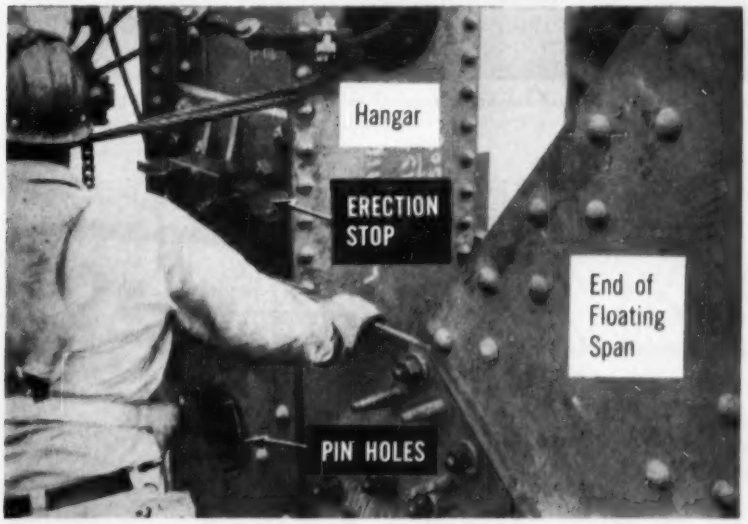
Landing

When all lines are connected, the barge assembly is maneuvered into an opening at the bridge. One end of the span must be landed on a pier and the other end pinned to a cantilever arm of the neighboring span. To prevent the span from colliding with the cantilever arm, the barges first are pulled in close to the pier. Then, they are moved longitudinally until one end of the span is over the pier. At the same time, members on the other end are knifed between ends of dummy chords on the cantilever arm. Come-a-longs tied to the pier at one end and the cantilever at the other end provide precise control during final positioning.

When the span is lined up over the pier, valves on the barges are opened and the assembly sinks. With all valves open, the span can be lowered up to 2 in. per min. Falsework is designed so that when



HANGER at end of cantilever arm, right, is held back until end of floating span is knifed into dummy chord members of arm. Then it is swung down between plates of floating span and positioned by hand until span lands on steel erection stop.



END OF SPAN descends along hanger until its inverted angle comes to rest on shelf angle on hanger. Angles serve as erection stop until 8-in. dia pin is driven below.

PIN connects end of span to hanger. Dummy chords are placed later by tower derrick.

the fixed shoe lands on the pier, the other end of the span has 3 in. of clearance.

The tricky job is making the connection at the cantilever arm. During initial positioning of the span, the hangers on the cantilever arm are swung back to make room for the end of the floating span. When the span gets close, crews face the problem of releasing the hangers, lining up a hole in each hanger with a corresponding hole in the end of the span, and keeping them lined up long enough to drive an 8-in. pin. Hand operated come-a-longs position the hanger.

Erection Stop

Taking advantage of the gradual transfer of weight from the floating span to the cantilever, Bethlehem engineers designed an erection stop on the hangers which holds the load of the span long enough for the pin to be driven. The erection stop is simple. Basically, it consists of two angles; a shelf angle on the hanger and an inverted angle on the span.

When the end of the span is moved in close enough, the hangers are swung down to make the pin connection. The end of the span continues to descend until its inverted angle comes to rest on the hanger's shelf angle. This automatically lines up the holes. Now men must work fast to drive the pin, because the falling tide throws more and more load on the erection stop. If the pin is not driven in 30 min, the barges must be pumped out to raise the span—thus reducing the load on the shelf angle. If necessary, Carter pumps with 10-in. suction and 6-in. discharge can raise the assembly at the rate of one in. per min. But generally, crews can drive the pins within the time limit and remove

Continued on next page

FIRST SPAN on far side of river is lowered directly on piers. Except first spans, all are landed on piers and cantilever arms. Two sets of barges are required to support longer spans. Cantilever arm will be erected on near end by tower derrick.

FLOATING-IN ERECTION

Continued

the load from the shelf angle.

Barges are flooded further until the falsework clears the bottom chards of the span. The assembly then is towed back to the erection dock, and the cycle is repeated.

At the span, a 35-ton tower derrick boat takes over. It places dummy chord members, and then moves to the open end of the just-floated span and erects a cantilever arm. In some cases, cantilever arms are as long as 117 ft.

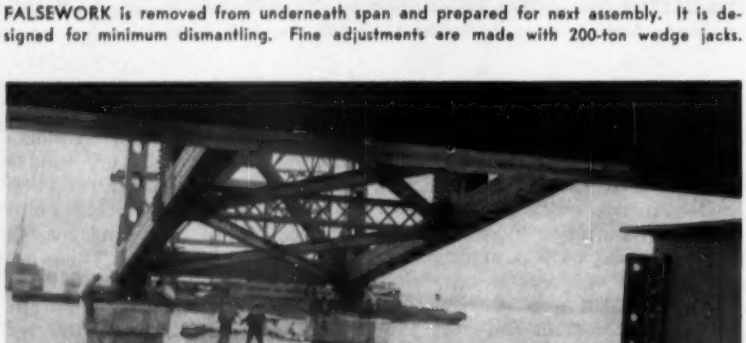
The derrick will also erect the bridge's center span over the channel. This 648-ft span will be cantilevered from two piers and will be joined at the middle. At mid-span the 22-ft bridge will provide 110 ft of vertical clearance.

The superstructure steelwork, comprising 12,855 tons, is being fabricated at Bethlehem's Pottstown, Pa., works and transported by rail and barges to the site.

Personnel

John McGonigle is resident engineer and C. L. Stroble is superintendent for Bethlehem Steel Co. Modjesky & Masters are the consulting engineers.

FALSEWORK is removed from underneath span and prepared for next assembly. It is designed for minimum dismantling. Fine adjustments are made with 200-ton wedge jacks.



DIAGONAL LINES fitted with come-a-longs pull fixed shoes over anchor bolts in piers. Other lines connected to hoists maneuver barge assembly for close positioning.

EDITORIAL

Will New Roads Save Live

With the nation's highway death tolls rising year by year, the new Federal Inter- Act offers a strong ray of fact

41,000 miles of new expressway be built. They will be wider, st safer roads. Crossings will b eliminated. If speeds are sen will be fewer acci

IKE SIGNS BIGGEST ROAD BILL EVER

Washington, D. C., June 29. Among some 50 bills signed by the President today was the $32,900,000,000 Federal Interstate Highway Aid bill passed by th

ONE GOAL

Since 1949, Caterpillar, your partner in earthmoving progress, has campaigned for better highways

41,000 MILES

OF NE

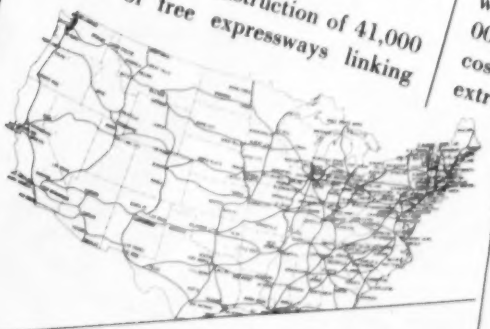
ON T

Washingto President go-ah

$32.9 BILLION HIGHWAY BILL GETS GREEN LIGHT FROM IKE

Washington, D. C., June 29—The largest public works program in history was signed into law by President Eisenhower today.

It calls for construction of 41,000 miles of free expressways linking



practically every large city and state capital in the nation. The building will take 13 years and cost $32,900,000,000. But the huge program will cost the average driver extra

GIANT ROAD BILL SIGNED

$33 Billion Highway Bill OK'd by Ike

Washington, D. C., June 29. President Eisenhower today signed into law the Federal Interstate Highway bill, largest public works program in history. It provides for Federal expenditures of $32,900,000,000 to build 41,000 miles of superhighw next 13

9500 LIVES SAVED

There were many good and compelling economic reasons for wer to sign the

victim roads

Rc

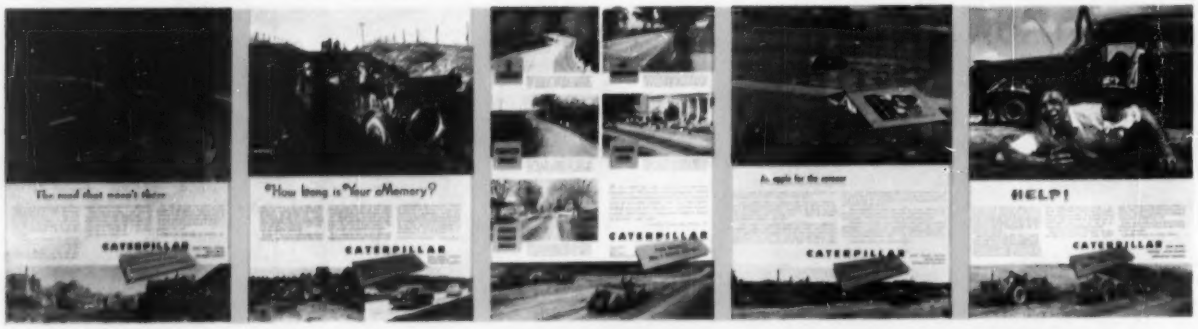
IKE APPROVES BILLIONS FOR NEW HIGHWAYS

Georgia's Share of Highway Funds Over $800 Million

Washington, D. C., July 2. The Government will spend $838,700,000 for highways in Georgia during the next 13 years, according to

March, 1949 November, 1949 January, 1950 February, 1950 September, 1950

November, 1950 February, 1952 June, 1952 September, 1952 November, 1952



February, 1953 March, 1953 May, 1953 September, 1953 October, 1953

November, 1953 January, 1954 February, 1954 May, 1954 June, 1954

Early in 1949, Caterpillar Tractor Co. began a series of full-page 4-color advertisements in *The Saturday Evening Post* and other national magazines. These pages were designed to forcefully awaken the public to the frightful toll of lives and money taken yearly by inadequate roads.

The 40 advertisements, reproduced in miniature above, give some idea of

January, 1955 February, 1955 March, 1955 April, 1955 May, 1955

July, 1955 September, 1955 October, 1955 November, 1955 December, 1955

January, 1956 February, 1956 March, 1956 April, 1956 May, 1956

June, 1956 July, 1956 August, 1956 September, 1956 October, 1956

the continuing impact carried by this campaign. In the last two years emphasis has been changed to show how various states are meeting the highway problem.

With a strong awareness of highway needs now in the public mind, the new Federal Interstate Highway Program has been enacted into law. The next two pages show a breakdown of probable highway expenditures by states.

Ala. $730,800,000

Ariz. $424,200,000

Ark. $529,000,000

Cal. $2,019,600,000

THE NEW INTERSTATE HIGHWAY SYSTEM AND PROPOSED FEDERAL AID TO STATES

These are the estimated Federal grants to states for the next 13 years, to be used for both the Interstate Highway System and other Federal-Aid roads.

These figures represent 90% of the cost for the Interstate System, 50% for the remainder.

Minn. $829,600,000

Nev. $371,100,000

N.H. $204,800,000

N.J. $753,900,000

N.M. $450,700,000

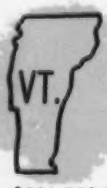
Okla. $661,200,000

Ore. $507,900,000

Pa. $1,865,800,000

R.I. $216,400,000

Utah $351,900,000



Vt. $201,200,000

Va. $718,400,000

Wash. $582,000,000

Col. $518,300,000

Conn. $342,500,000

Del. $202,200,000

Fla. $608,400,000

Ga. $838,700,000

Idaho $364,300,000

Ill. $1,668,500,000

Ind. $872,100,000

Iowa $751,300,000

Kan. $683,300,000

Ky. $666,900,000

La. $588,500,000

Me. $284,400,000

Md. $418,700,000

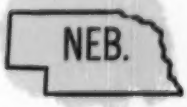
Mass. $735,700,000

Mich. $1,277,600,000

Miss. $574,000,000

Mo. $986,400,000

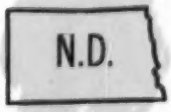
Mont. $539,000,000



Neb. $544,100,000

N.Y. $2,469,500,000

N.C. $903,500,000



N.D. $406,900,000

Ohio $1,509,300,000

S.C. $476,900,000

S.D. $427,700,000

Tenn. $766,800,000

Texas $2,112,500,000

W.Va. $418,200,000

Wisc. $822,600,000

Wyo. $369,900,000

D.C. $220,900,000

CATERPILLAR—
your partner in earthmoving progress—
has the equipment ready for the big job

The mighty D9, with 320 Turbocharged engine HP and No. 9S Loadshape Bulldozer, heads the line of six Caterpillar crawler Tractors. The other machines, with engine HP, are: D8—191 HP, D7—128 HP, D6—93 HP, D4—63 HP, and D2—48 HP.

The Turbocharged 300 HP DW21 with the 25 cu. yd. (heaped) capacity No. 470 LOWBOWL Scraper provides a fast, highly maneuverable earthmoving unit.

The No. 977 Traxcavator of 2¼ cu. yd. bucket capacity is the largest of the three Cat-built tractor-shovels. The No. 955 has a 1½ cu. yd. bucket; the No. 933, a 1 cu. yd. bucket. Lift forks and other attachments give added versatility to these highly productive units.

The No. 8 Ripper, for use with the D8 Tractor, is one of a line of five Cat-built tractor-mounted rippers. In addition to the No. 8, they are: the No. 9, the No. 6, the No. 4 and the No. 2 for use with other Caterpillar-built Tractors and Traxcavators.

The four-wheel DW20, with Turbocharged 300 HP Cat Engine, teams up with the LOWBOWL No. 456 Scraper (25 cu. yd. capacity) for high-speed earthmoving on longer hauls. The four-wheel 186 HP DW15 works with the No. 15 Scraper (12½ cu. yd. capacity).

Representative of the Cat four-wheel, crawler-drawn Scraper line is the No. 463. Heaped capacities are: No. 90, 27 cu. yd.; No. 463, 25 cu. yd.; No. 70, 15 cu. yd.; No. 60, 9 cu. yd.; and No. 40, 4.5 cu. yd.

Caterpillar Electric Sets are available in eight basic models ranging from 30 to 350 KW. Available in portable units, they are a reliable and convenient source of electric power.

Nine basic sizes, from 65 to 650 HP, make up the line of Caterpillar Diesel Engines. They are used by over 100 manufacturers to power excavators, compressors, crushers and other construction machines.

Heading the line of three Cat Motor Graders is the 115 HP No. 12. The No. 112 has 75 HP; the No. 212 has 50 HP.

N. J. GIRDS TO PUSH ROAD CONSTRUCTION

Highways Officials and Senators Confer on Possible One-Cent Gas Tax Rise

Trenton, June 29. The ex- | tion, according to state high- | a 90-10 basis for interstate
way officials here. New Jersey | roads, and one-third on a 50-50
basis to finance primary, sec
ondary and urban roads. Th

41,000 Miles of Super-Highways i New Federal Bill

Next year—and the years ahead—offer you the greatest challenge in the whole history of construction. The highway work alone will dwarf any previous undertaking.

Caterpillar has been preparing for this time. Plant capacity has been doubled and is still expanding. New and improved products are now in full production, giving you equipment designed and built to do more work, faster, at lower cost. When you bid on a contract, that kind of equipment can make the difference between profit and loss.

Caterpillar leadership is leadership *in action*. It never stands still. The full resources of Caterpillar research, both in the laboratory and right in the field with you, are constantly devoted to the development of even more efficient engines and earthmovers—equipment that keeps pace with your increasing opportunities.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar, Cat and Trascavator are Registered Trademarks of Caterpillar Tractor Co.

YOUR PARTNER IN EARTHMOVING PROGRESS

STATE TO GET $230 MILLION IN FEDERAL FUNDS BY 1959

Illinois Total Over $1½ Billion for 13-Year Highway Building Era

Washington, D. C., July 3. Estimates released by the U. S. Bureau of Public Roads call for $229,700,000 of Federal funds to be spent in Illinois in three years, starting July 1, 1956.

This represents 90 per cent of Interstate road construction costs. The state will furnish the additional 10 per cent. For the full 13-year period covered by the Federal Highway bill it is estimated Illinois will receive nearly $1,700,000,000.

41,000 MILES OF HIGHWAYS APPROVED BY PRESIDENT

Washington, D. C., June 29—You're going to get 41,000 miles of new four, six and eight lane highways in the next 13 years.

It became official today when President Eisenhower signed the Federal Interstate Highway bill. Under the new law, the Federal government will spend $32,900,000,000 through 1969 for the new roads.

The bill calls for a vast network of free superhighways linking most major cities and state capitals.

HIGHWAY BILL BOON TO UTAH ROAD SYSTEM

Salt Lake City, July 3—Over-all spending in Utah for highways in the next three years will rise from $25.2 million to $88.6 million. And for the succeeding 10-year period it will continue in the $75 to $95 million bracket.

This will result from the new 13-year road building program signed into law by President Eisenhower. By 1970 Utah will be criss-crossed by splendid four and six lane divided highways.

The state now has some 700 miles of interstate highways and the bill provides for a rebuilding of an amount equal to this mileage.

$32.9 Billion Highway Bill a Bargain for Car Owner

New Taxes on Gas, Tires to Cost Average Driver Only $8.60 per Year

Washington, D.C., July 2. The Federal Highway Aid bill, which has been high on the President's list of must legis- | It is a pay-as-you-go program. But the $33 billion total, to be paid for by a 1-cent increase in the gasoline tax, 3 cents a pound for tires and a 2 per cent rise in the price of trucks, buses and trailers, will result in safer, more economical driving. The average car owner will pay only $8.60 a

At home in rugged terrain, ruggedly-built Le Roi compressor functions consistently on mountain top after 1500-ft. piece-by-piece air lift.

Contractor Air-Lifts Compressor to Wind-Swept Mountain Top

Le Roi air compressor provides power for test-site uranium drilling, after getting a lift from a helicopter up sheer canyon walls.

Compressor operates in temperatures as low as 20 below zero on 7,000-ft. Wingate formation.

Getting a Le Roi 105 cfm portable air compressor on top of a mountain, bordered by sheer canyon walls 1500 feet high, seems to pose a problem. The Atlas Corporation took the situation in stride when they decided to test-drill for uranium on the 7,000-foot Wingate formation of the Rocky Mountains near Hidden Splendor, Utah.

Dismantling the compressor was the first hurdle in getting it up on the mountain. This was relatively simple because Le Roi machines are designed for accessibility and easy servicing.

Then a helicopter flew the unit up over the canyon walls piece by piece. The compressor was quickly reassembled on the mountain drilling site and went to work.

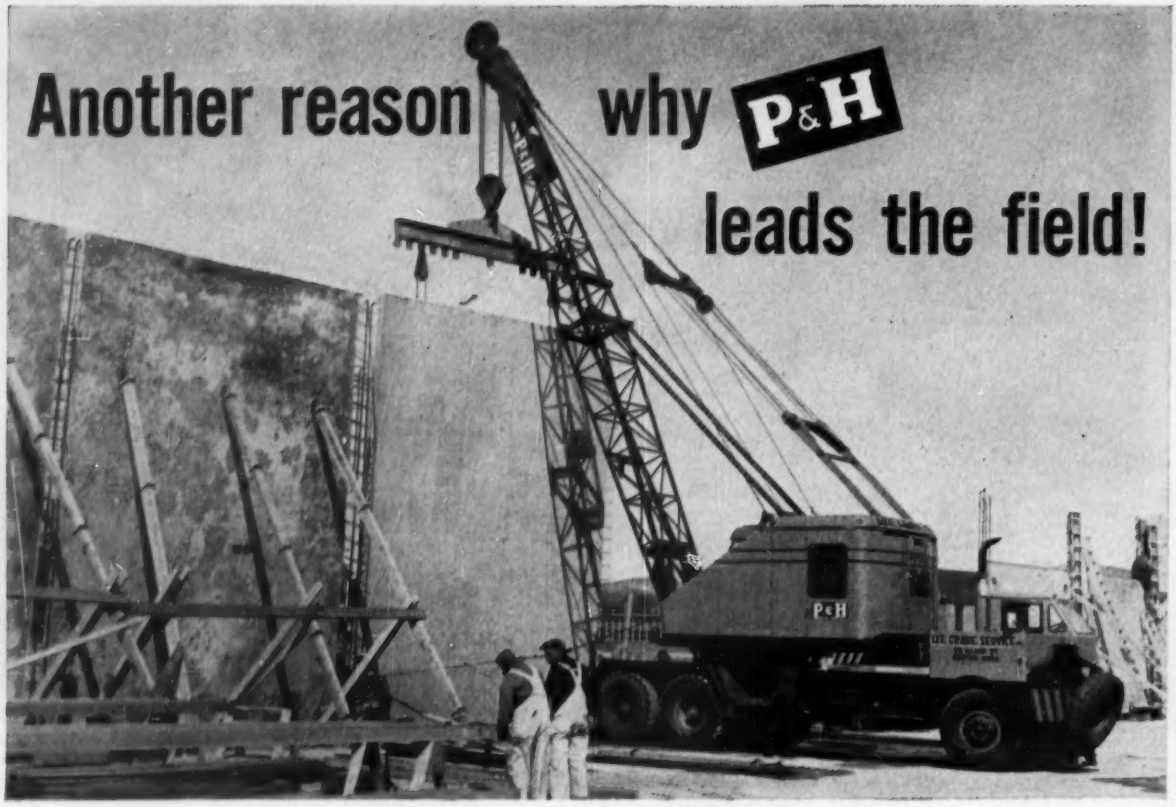
20 below zero temperatures on the wind-swept mountain range had no effect on the work. The quick-starting Le Roi 105 cfm compressor provided dependable amounts of air power whenever it was needed. Often, the drilling was done nearly a half-mile from the compressor site. Even in this unusual condition, the compressor supplied a steady supply of air for the testing operations.

Le Roi compressors are designed for tough jobs like this. They give you above-average performance under the most adverse conditions. Use Le Roi air compressors on your jobs for reliable performance every day, everywhere. There's a Le Roi distributor nearby to serve you.

C-173

LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wis.

Another reason why P&H leads the field!

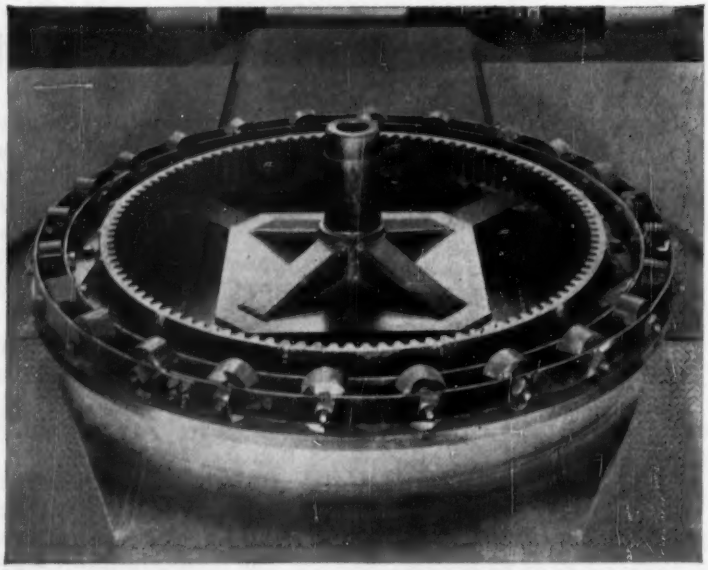


P&H Model 555A-TC with 35 ton capacity handles a wide range of jobs.

You'll recognize this view as one of the most important parts of the rugged P&H equipment. No other power crane or shovel offers operators a swing action that is equal to P&H in smoothness and speed. And that fast, smooth swing means more profitable production.

It's accomplished by putting the weight on the multiple rollers which, in turn distribute the weight over the entire diameter of the specially machined roller circle — just like a mammoth roller bearing. The rollers themselves carry the weight — the center pin merely acts as a guide.

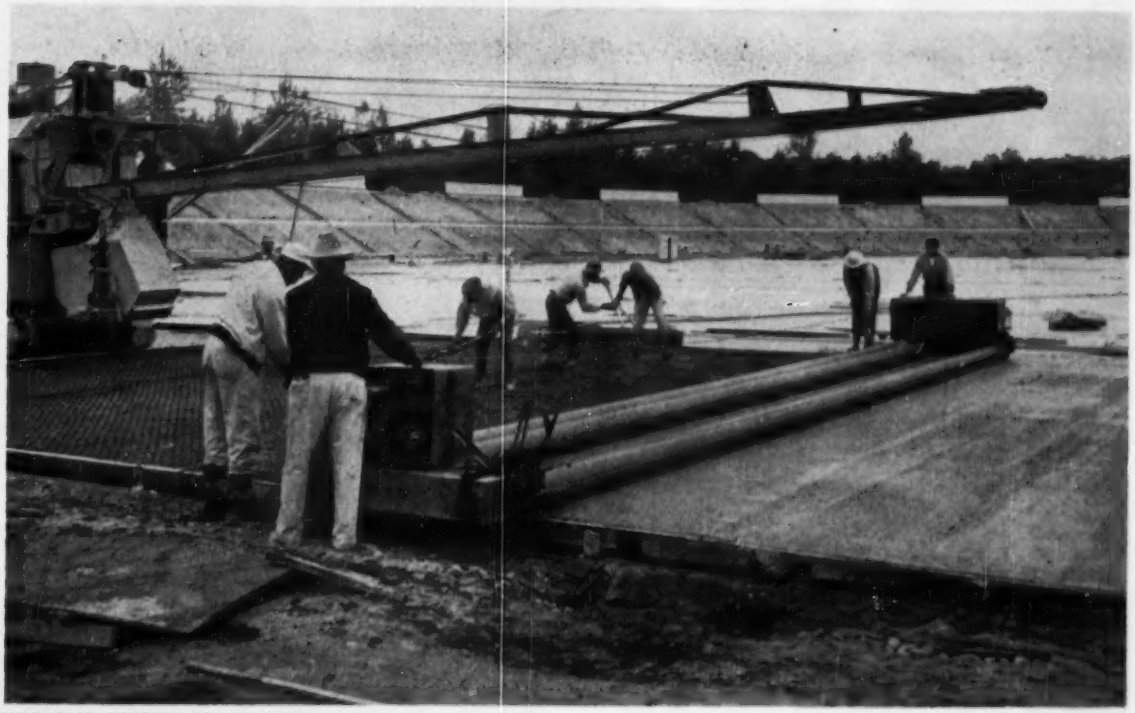
Make certain you get the advantages of P&H live roller circle on your next power crane or shovel. Specify P&H.



BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA · See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957 AMERICAN ROAD BUILDERS ASSOCIATION

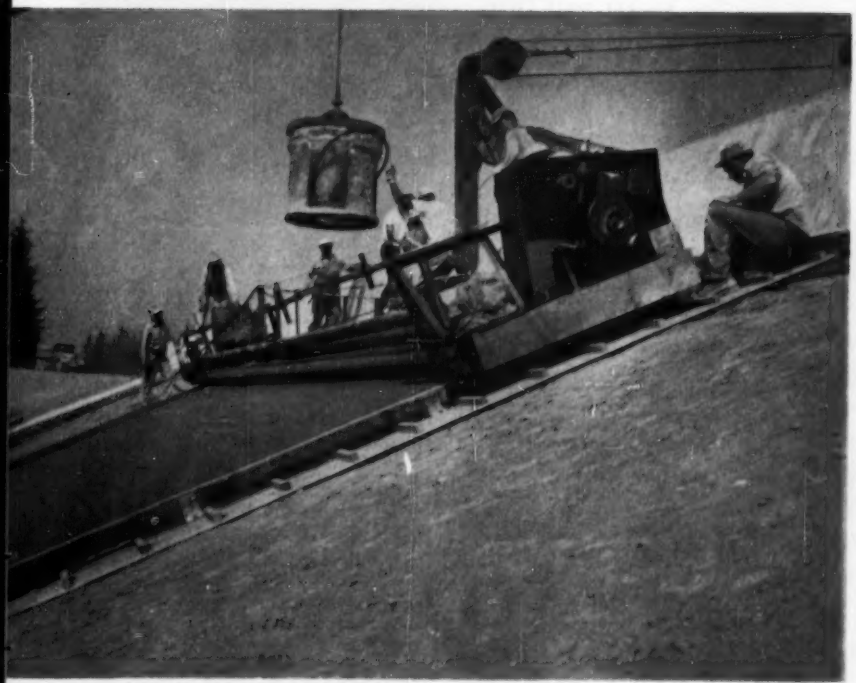
HARNISCHFEGER

Construction & Mining Division, Milwaukee 46, Wisconsin



VIBRATING SCREED with three 40-ft rollers follows closely behind a Koehring 34E paver that is placing concrete for reservoir floor. An 11-ft extension was welded to standard 35-ft boom so that paver could handle pours for 40x40-ft slabs. Slabs were 6 in. thick.

Big Rigs Place 40x40-ft Slabs



CLARY SCREED also handles reservoir's sides where slabs are 42-ft long on a 2-to-1 slope. Bucyrus-Erie backhoe holds screed as it works from floor to top of the slope.

A PAVER with a 46-ft boom and a vibrating screed with 40-ft rollers permitted the contractor to place the floor of the 1,000,000-gal McMillan reservoir in 6-in. thick 40x40-ft concrete slabs.

Although such slabs normally are no larger than 30x30 ft, engineers for the Tacoma, Wash., reservoir called for the larger slabs because they would cut drainage costs by a third. This saving was accomplished because the distance between drains was extended to meet the joints of the larger slabs.

To pour these big slabs, the contractor, Cherf Bros & Sandkay of Ephrata, Wash., modified the 35-ft boom of a standard Koehring 34-E paver by welding on an 11-ft cantilevered extension and hooking up a three-part line for additional strength. The counterweight was increased by three tons.

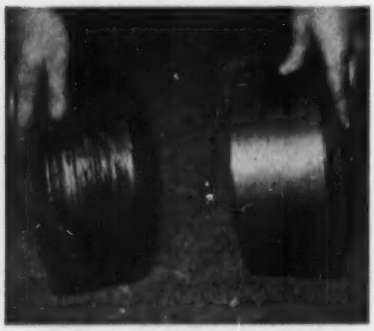
Although the contractor could only half fill the 2½-yd concrete bucket, the paver completed an average of 19 slabs (30,000 sq ft) a day. Each slab of the 1,100x732-ft floor took 30 yd of concrete. Con-

Continued on page 82

HOUSE ROLLS are automatically built up with 2 or 3 passes of Stoody 104.

How one of the country's large contracting firms MAINTAINS SHOVEL PARTS

The shovel parts illustrated here are typical of those regularly rebuilt and hard-faced by George M. Brewster and Son, Inc., famous for the big jobs handled, such as the New Jersey Turnpike and approaches to the George Washington Bridge. Standard maintenance practice includes complete restoration of worn house rolls, buckets, bucket teeth, pads and tumblers.



After rebuilding, the Stoody 104 deposit is machined to original size. This is one of the few parts requiring machine work. Others go into service "as-welded."

In the Brewster operation Stoody Hard-Facing Alloys are used for both manual and automatic applications. They help to keep equipment in service longer between repair periods and reduce the number of replacement parts that must be stocked. Life of rebuilt parts is invariably equal to or greater than the original equipment—yet the cost of rebuilding and hard-facing is but a fraction of new part costs.

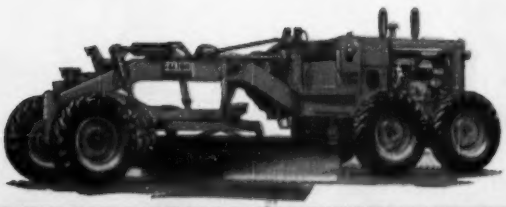
Procedures followed here and by other major earth-moving contractors are described in detail in the Stoody Hard-Facing Guidebook and other Stoody literature; consult your Stoody dealer (see the "Yellow Pages" of your phone book) or write direct for full information.

WORN SHOVEL PADS. Conventional treatment includes rebuilding worn areas with Stoody Manganese and manually hard-facing with Stoody 1027.

OTHER SHOVEL HARD-FACING APPLICATIONS

Besides the applications shown, Stoody Hard-Facing Alloys are regularly used all over the nation for rebuilding and protecting Shovel Idlers, Drive Tumblers, Boom Heels, Latch Bars, Latch Plates, Buckets and Bucket Teeth. Wherever there's wear, you'll find effective prevention with STOODY ALLOYS!

STOODY COMPANY
11972 East Slauson Avenue
Whittier, California



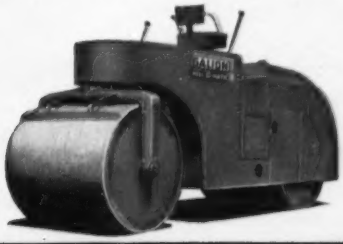
GRADE-O-MATIC

GRADE-O-MATIC Drive utilizes a torque converter with tail shaft governor and power-shift transmission, in combination with correct balance of grader weight and power to produce most "push-power" at the blade. No foot clutch or gear shift lever. Automatic features simplify operation and provide top-most performance.

GRADE-O-MATIC GRADERS

Model T-700 . . . . . 190 h.p., 40,125 lbs.
Model T-600 . . . . . 140 h.p., 30,420 lbs.
Model T-500 . . . . . 125 h.p., 25,765 lbs.

THESE NAMEPLATES *are your assurance of* UNSURPASSED PERFORMANCE



ROLL-O-MATIC

ROLL-O-MATIC Drive utilizes a torque converter in which the engine driving force is automatically MULTIPLIED and applied in an infinite number of driving ratios as the work demands. No master clutch, no engine throttle- no gear shifting. Shock loads and engine stalling are eliminated. Life of roller is increased.

ROLL-O-MATIC ROLLERS

TANDEM MODELS — Variable Weight
Two-Axle . . . . 5-8, 8-10½, 8-12, 10-14 ton sizes.
Three-Axle . . . . . 14-20 ton size.

THREE-WHEEL MODELS
"Chief" . . . . . 4 sizes, 10 to 16 ton.
"Warrior" . . . . . 2 sizes, 7 to 10 ton.
Both "Chief" and "Warrior" Three-Wheel Rollers are available with ballastable or non-ballastable rolls.

Write for complete information

GALION

THE GALION IRON WORKS & MFG. COMPANY

General and Export Offices, Galion, Ohio, U.S.A. Cable address: GALIONIRON, Galion, Ohio

See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957

BIG RIGS POUR SLAB . . .

continued from page 79

crete was poured over 4x4 - 3/3 welded wire mesh reinforcement. No. 4 bars formed the slab perimeter.

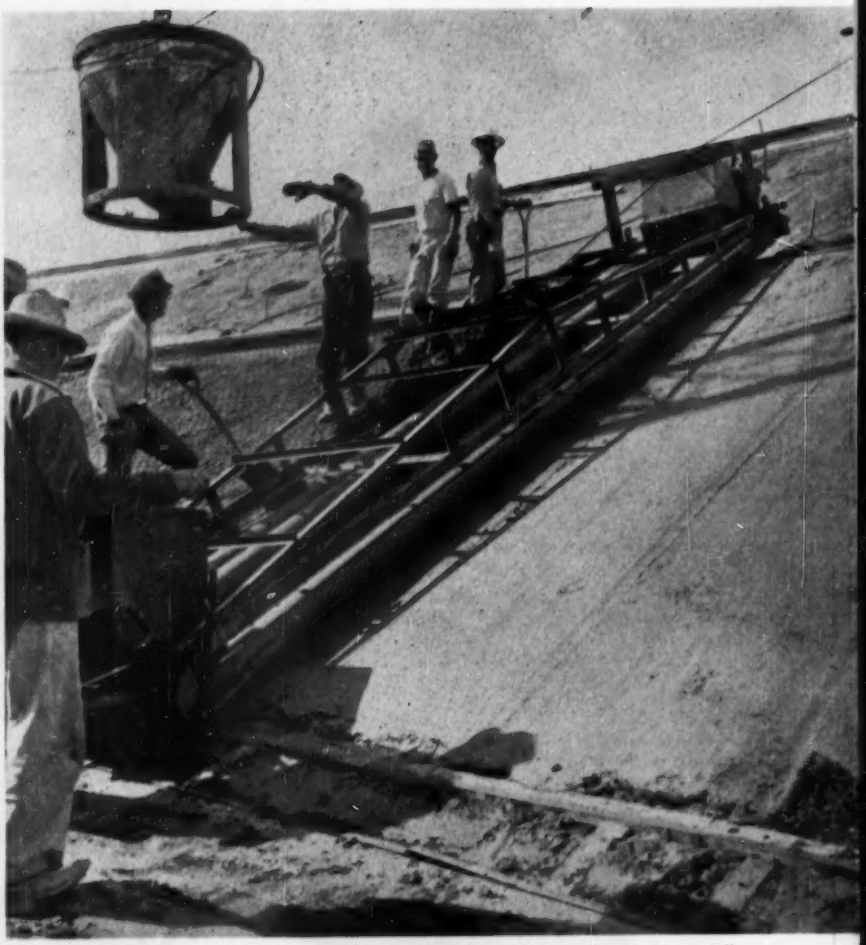
A Clary self-propelled vibrating roller screed—one of the largest of its type ever built—followed closely behind the paver. The same screed was used on the sides of the reservoir, where slabs were 42 ft long on a 2-to-1 slope. On the sides, the screed was held by a six-part line from a Bucyrus-Erie backhoe as it worked from the floor to the top of the slope.

A similar screed with 22½-ft rollers handled the curved sections of the wall. Here, the width of the slabs was held to 20 ft. The smaller screed, which was held in place by a Bucyrus-Erie 22-B crane, worked horizontally along the slope instead of up and down. A Link-Belt Zephyr crane moved it from one section to another.

The two screeds worked so well that only four men were needed for hand finishing. According to the contractor, this is about one-third of the crew that normally would be required. Two job-built platforms for the finishing crew also speeded the job. One platform was suspended on rails so that it rode up and down the poured slab. The other platform, used for the curved sections, rode horizontally.

The 40-ft screed has three 8-in. dia steel rollers—two rear rollers that control forward and reverse travel, and a tamping roller. The two rear rollers travel on top of the forms or headers, but the eccentrically mounted tamping roller rides slightly above the headers because of vibration developed by the eccentric mounting. The tamping roller, which also acts as a strike-off bar, revolves in the opposite direction from the way the screed travels.

In forward motion the screed is propelled by the middle roller under power from a 3½-hp Briggs & Stratton engine. It moves the screed forward at a 12 to 15-ft-per-min rate. The rear roller, which provides reverse travel, is powered by a 2-hp engine. Eight-hp, 600-rpm engines mounted on both ends power the tamping roller. The engines can be operated independently so that one end of the roller can move ahead of the other if necessary. All controls are mounted on the left side.



SMALLER SCREED with 22½-ft rollers handles curved sections. This screed works horizontally along slope instead of up and down. Crane moved screed from slab to slab.

FINISHING CREW consists of only four men, about a third of the crew normally required. Job-built platforms riding horizontally and vertically along slopes speeded finishing.

Joints between the 40-ft slabs were made watertight with a 6-in. wide, 16-oz copper waterstop. This was placed over a two-ply, 30-lb asphalt paper laid over the 15-in. wide drain slab cover. The water stop was topped with ½-in. thick, 3¾-in. high Elastite. The Elastite was supported by sheet metal marginal strips anchored in place by No. 4 wire stubs. These were tack welded to the strips and to the slab perimeter bar. Rubberized asphalt was used to seal the key, which was protected during pouring by a temporary wood batten insert.

The reservoir was built by Cherf Bros & Sandkay under a $1.1 million contract from the Tacoma, Wash., Water Division.

"Our new Heil dump truck bodies... built with USS MAN-TEN steel ...are superior in every respect"

says **Don L. Tew**, Asst. Manager
Ronald Kenyon Construction Company, West Des Moines, Iowa

To avoid collision with an oncoming car, a Ronald Kenyon Construction Company driver swerved his truck onto a soft dirt shoulder, causing the heavily laden vehicle to overturn. The gravel load was spilled, there was some $500 miscellaneous damage, but the dump body—built of USS MAN-TEN High Strength Steel—had only a bent cab protector.

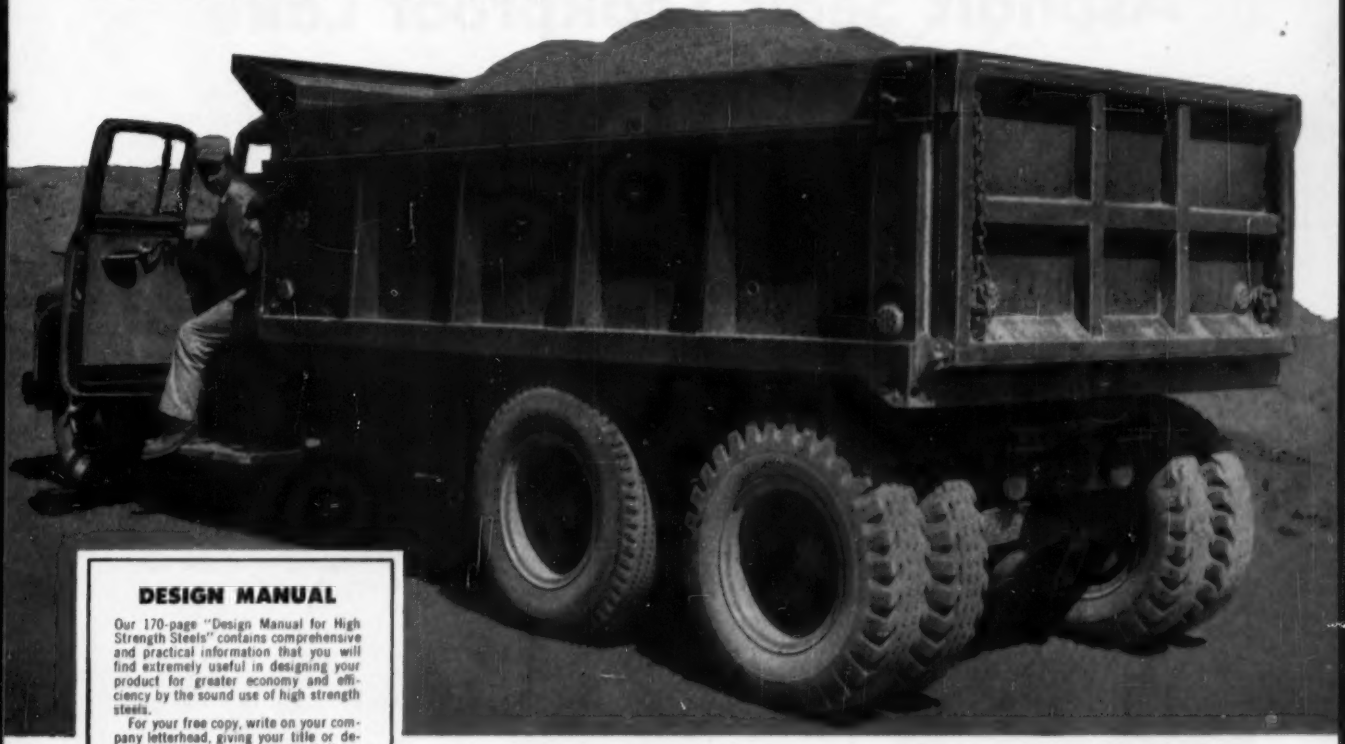
"That accident showed us the quality of the steel in our new truck bodies," explains Mr. Tew. "The purchase of these new Heil LHT-11 steel dump bodies was one of the smartest investments we ever made."

Working with Mr. Tew, B. A. Mackey, a distributor for the Heil Co., Milwaukee, Wis., and Detroit Automotive, engineered a truck that would have a greater payload capacity than older trucks. The finished truck body weighs 3,200 pounds—1,200 pounds less than old-model carbon steel bodies. It measures 13 x 7 feet and has a capacity of 8 to 10 cubic yards. The Kenyon Construction Company holds a large contract with the Iowa Highway Commission to widen 55 miles of concrete highway east of Des Moines. Some of the 11 new trucks were immediately put into service hauling gravel from a quarry 43 miles away. Others haul sand and asphaltic concrete at a temperature of 300 degrees.

"Although each new body costs slightly more than a carbon steel body," continues Mr. Tew, "its added payload capacity pays for this increase in only 27 operating days. These bodies have certainly lived up to advance hopes. Although they have seen thousands of miles of service, there has been no rust or pitting, and the tailgates are still working perfectly."

USS MAN-TEN Steel—one of the three outstanding USS HIGH STRENGTH STEELS—has a yield point 1½ times that of carbon steel, has 2 times the resistance to atmospheric corrosion, has 50% greater fatigue strength and offers superior resistance to abrasion and impact.

THESE NEW HEIL LHT-11 TRUCK BODIES are made largely of 10-gage USS MAN-TEN Steel instead of 8-gage carbon steel. Working "double shifts," each truck makes eight trips a day, and according to Mr. Tew, saves the company $8.25 in 24 hours. These bodies ride on especially engineered trucks featuring a 182-in. wheel base instead of a 172-in. base, and a 9000-pound front axle instead of a 6000-pound axle.



DESIGN MANUAL

Our 170-page "Design Manual for High Strength Steels" contains comprehensive and practical information that you will find extremely useful in designing your product for greater economy and efficiency by the sound use of high strength steels.

For your free copy, write on your company letterhead, giving your title or department, to United States Steel, Room 2801, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

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USS HIGH STRENGTH STEELS

USS MAN-TEN • USS COR-TEN • USS TRI-TEN

UNITED STATES STEEL

DISTRIBUTOR with spray bar mounted as an outrigger places asphaltic membrane ¼ to ⅜ in. thick in three passes. Tank capacity of 1,250 gal is enough to apply 1.35 to 1.50 gal per sq yd over a strip 12 ft wide and approximately 1,000 ft long.

Asphalt Seals Leakproof Lake

SEALING an area of 100 acres with an asphaltic membrane cover is the key to construction of a leakproof lake at the U. S. Army's Rocky Mountain Arsenal near Denver, Colo.

Long Construction Co. of Billings, Mont., got the job on a low bid of $497,323 and worked out an effective and ingenious method of placing the asphaltic cover.

The lake, to be created by putting a dike at one end of a natural swale, will be approximately 2,900 ft in one dimension and 1,600 ft in the other. Its capacity will be about 1,000 acre-ft, and it will serve as a depository for liquid waste produced at the arsenal.

The Corps of Engineers designed the lake as a leakproof pan because arsenal authorities considered it preferable that the liquid waste should be reduced by evaporation rather than by infiltration. The Engineers specified placement of the asphaltic membrane over the bottom of the lake when their investigations indicated it to be the most economical of the several methods considered.

Long puts down the membrane in strips 12 ft wide with a 1,250 gal distributor modified by placing the spray bar on an outrigger to one side. The asphalt is the last residue of the petroleum distillation. A catalyst blown into it produces a chemical change that results in a very tough, rubbery, and extensible membrane — one that adapts itself easily to the smallest irregularities of the surface on which it is laid.

Asphalt comes from a Denver refinery in insulated tank trucks of 5,000-gal capacity. It is heated at the refinery to have a temperature of between 350 and 400 deg at the time of placement.

Specifications call for the placing of a membrane between ¼ and ⅜ in. thick.

Long builds up the membrane in three passes, changing the angle of the spray bar on each pass to obtain more even distribution.

First a strip of lake bottom is

MEMBRANE is tough and rubbery. Temperature at time of placing is 350 to 400 deg, but it can be lifted five minutes after placement. Membrane does not adhere to the soil.

Often seen in Engineers notebooks

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A dependable outfit that can fill any gear order. They talk "quality" and that's exactly what they give us. They deliver on time! Emergency service when needed.

They always meet our specs

Ed—
Will use Illinois Gear as our source. I like their quality and service too!
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Look for this mark ILG the symbol on finer gears

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Gears for Every Purpose ... one gear or 10,000 or more

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Allis-Chalmers LOW-COST Model D

BIG

in power
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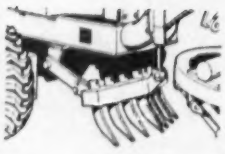
in versatility

THE MODEL D GRADER HAS THE POWER to tackle bigger jobs. With either 50-hp gasoline engine or 50-hp diesel engine, there's extra torque and lugging ability for top performance on all projects.

BIG-GRADER DESIGN means long life for the Model D — regardless of the job. Strong, single-member main frame . . . husky drawbar and one-piece circle . . . work-boosting ROLL-AWAY moldboard . . . ground-gripping tandem drive . . . precision control . . . easy operation and simple servicing — all are plus performance advantages.

JOB-MULTIPLYING ATTACHMENTS make the Model D a *specialist* on many applications:—

ROLL-AWAY is an Allis-Chalmers trademark.



HYDRAULIC SCARIFIER — exclusive mid-ship mounting under D's heavy end for better steering, maximum traction and full penetration. With seven removable teeth, scarifier cuts a swath 27¾ in. wide.

ALSO output-boosting extras — rear-mounted ⅝-yd loader, shoulder maintainer, windrow eliminator, snowplow blades. Plus optional equipment — including power circle turn, shiftable moldboard, leaning front wheels, all-weather cab, heater, etc.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION
MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

See the Model D at your Construction Machinery Dealer — headquarters for True Original Parts and Service.

WORKING in tandem, two Caterpillar patrols with Domor elevating graders place a blanket of earth 1 ft thick over the membrane in successive passes. At the same time, the graders excavate another strip to grade in preparation for application of the asphalt.

CLEANING spilled dirt from edge of completed strip with compressed air from a portable compressor helps assure a tight bond with next strip. Strips overlap 4 to 6 in.

ASPHALT SEALS LAKE . . .

Continued from page 84

excavated to grade and rolled until the surface is smooth. Then the distributor makes three passes, applying the asphaltic material at a rate of 1.35 to 1.50 gal per sq yd. Finally elevating graders, working in tandem, place an earth blanket 1 ft thick on top of the completed membrane, and a light blade smoothes the blanket.

Bond Between Strips

The graders actually do two jobs at one time. While they are placing the earth blanket on top of one strip of membrane, they also are excavating a second strip to grade.

The graders lay down the earth blanket by successive passes of about 1 ft each until only about 1 ft of the strip remains exposed. Before the adjacent strip of membrane is placed, a portable compressor unit travels the length of the strip to blow away dirt spilled on the exposed edge of the membrane. The clean surface assures a tight bond between adjacent strips. Overlap is 4 to 6 in.

Long's contract also includes installation of vitrified clay pipe to carry waste from the arsenal to the reservoir. Work on the job started in June and now is being wound up. It is a project of the Omaha District of Army Engineers, Col. Thomas J. Hayes, district engineer. Lt. Col. Herschel E. Linn is area chief at Denver.

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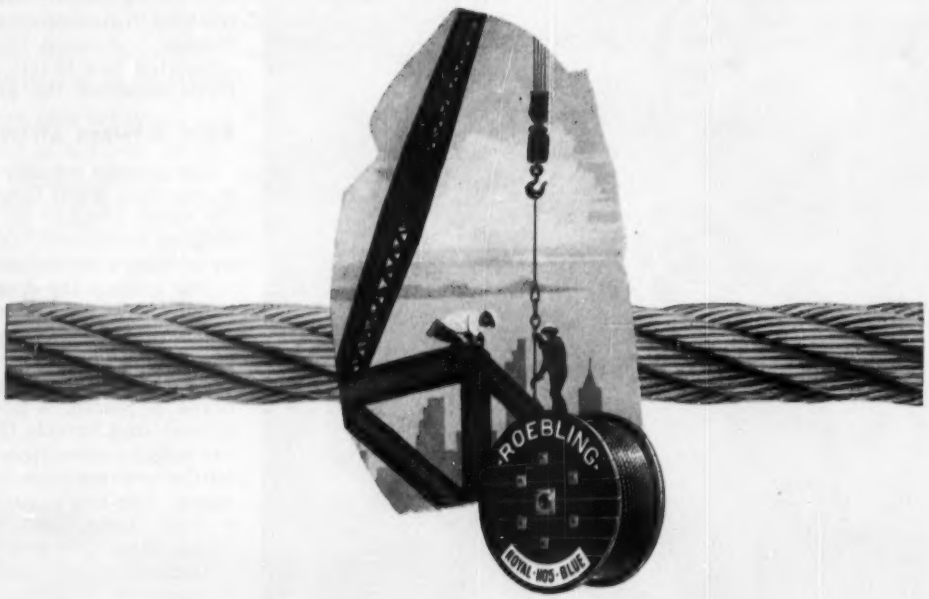

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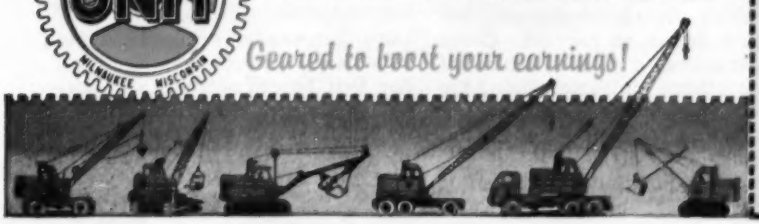
Geared to boost your earnings!



UNIT CRANE & SHOVEL CORP.
Milwaukee 14, Wisconsin

Please send me your new Bulletin on the UNIT CHALLENGER Model 510.

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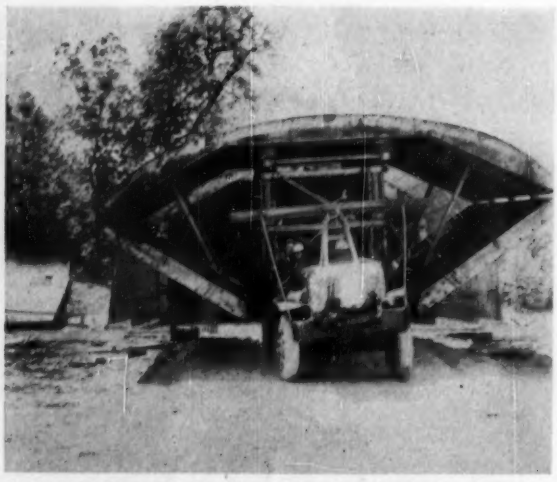
HINGED FORMS easily are maneuvered into position with this Army 6x6 truck-traveler. Hydraulic jacks and ratchets adjust forms.



PREFAB INSIDE FORMS, designed and made by Blaw-Knox, are hinged in four sections to simplify positioning and ease stripping.

Save "Yurt" Time, Use A Truck!

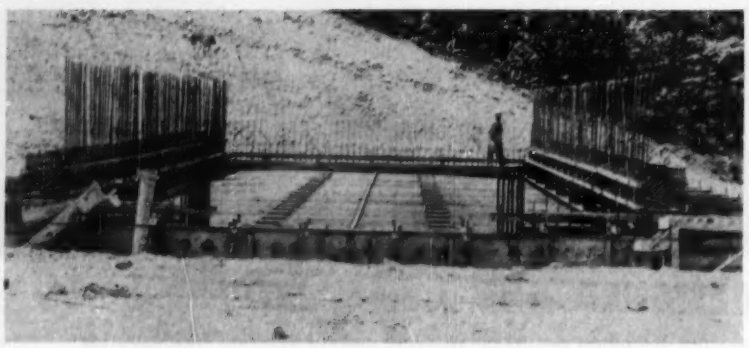
CONCRETE "YURTS" you may never need. But converting an old truck into a form traveler might speed your job like it did for an Army contractor building 478 of the nomad huts at Anniston Ordnance Depot, Anniston, Ala.

Not long ago, Office, Chief of Ordnance, U.S. Army decided that igloo-like structures being used for ammunition magazines were inefficient. The huts required too much building and yielded too little storage space.

In an effort to solve the problem, the Army turned to yurts. Yurts are structural huts traditionally used by nomadic tribes of Central Asia as homes. They are made of skins or felt stretched over a lattice framework. These huts have a rectangular shape with side walls rising vertically for 8 ft then curving into an arched roof.

The Army figured to make yurts of concrete instead of skins and use them rather than igloos for ammunition storage. The Army called in Architect-engineers Black & Veatch of Kansas City, Mo. who redesigned the Asiatic huts for concrete construction.

Each of the yurts at Anniston has a floor area measuring 25x80 ft. Side walls are 8 ft high with vertical inner faces and battered outer faces. An elliptical barrel arch roof has a clear span of 25 ft and intrados having a rise of 6 ft. Clear height at the crown is 14 ft.



BASE REINFORCING extends up through foundation footers to provide ties for basket reinforcing at Yurt's side walls, rear wall, and crown. Yurts measure 25x80 ft over-all.

Construction begins with the installation of base reinforcing and the pouring of a floor pad and foundation footers. Rods protrude from the footers and serve as anchors for steel reinforcing of rear wall, side walls, and arch. Rods are welded together to form a continuous reinforcing basket for wall and roof.

Contractor Ingenuity

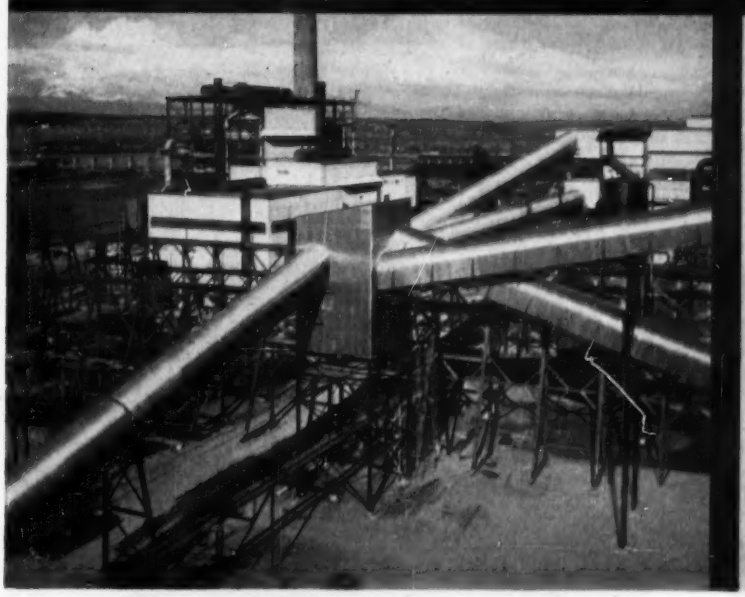
It was in the construction of concrete walls and roof arch that combined contractor-engineer ingenuity began to pay off. Coosa Constructors, a joint venture of four southern contractors doing the job, wanted to mass produce the superstructures, all of which are identical in design.

Several possibilities presented themselves. Foremost was precasting combined sections of walls and roofs and lifting them into place by crane. But that would mean lost time in fitting superstructure to foundation and finding a means of anchoring the two together. Any mass producing that could be done would have to be done with cast-in-place methods. Coosa called in Blaw-Knox to plan and make a form that could do the job.

Blaw-Knox came up with an inside combination wall and roof form that was both collapsible and capable of multiple uses. The form has four hinged sections with hydraulic jacks and ratchets on each section that permit ready adjustment of the form to crown height and side wall spread.

(Continued on page 92)

Conveyor Belts...



By the foot...

just 60 feet of new U. S. SteepGrade belting (on this Travelift, Phelps Manufacturing Co., Van Nuys, Calif.) helped *triple* the daily hauling capacity of this California roofing company.

By the mile...

world's longest wood pulp conveyor system (Weyerhaeuser Timber Company, Everett, Washington) utilizes two-and-a-half miles of U. S. Giant® conveyor belting.

Regardless of the size of belt—regardless of the job—regardless of the location—your reliable supply point is the nearest U. S. Rubber District Sales Office.

Complete belting service, expert splicing, belt engineering and conveyor design help, and the most complete line of materials handling belts—all are yours without delay.

The "U. S." belting engineer will show you the unique "U. S." belt kit which enables him to custom-build a miniature sample—right before your eyes—of the right type and size belt for your requirements.

Contact any of the 28 strategically located "U. S." District Sales Offices, or write us at Rockefeller Center, New York 20, N. Y.

Mechanical Goods Division

United States Rubber

SAVE "YURT" TIME...

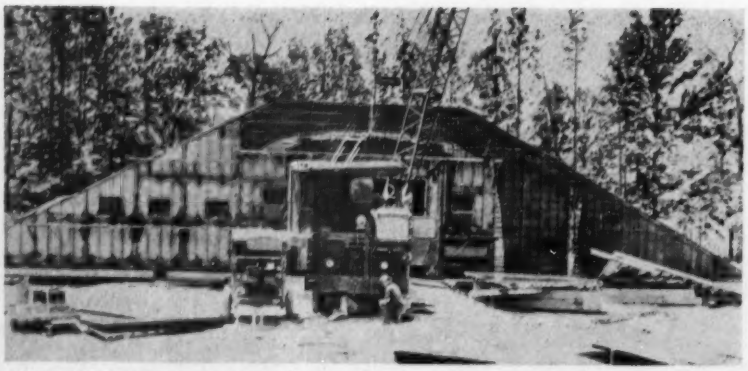
Continued from page 90

The form seemed adequate but Coosa still had to find a means of moving and placing it. An old Army six-wheel truck provided the solution.

"We decided to convert a 6x6 truck into a form traveler," said J. M. Field, job project manager.

A steel frame jumbo was set on the truck frame. Four 20-ton hydraulic jacks were placed under the jumbo corner posts. Carrying the form on the jumbo, the truck has only to drive under the reinforcing cage. Here the jacks under the corner posts lift the form to proper grade. Form side panels next are lowered to a vertical position and braced securely against the footing with steel plates. Jacks then are lowered, releasing the jumbo. This leaves the form standing supported by its side panels. The truck can then be driven away.

Outside form panels, prefabricated into 12x20-ft sections are placed by crane. Steel spacers attached to the outside forms and located at the beginning of the crown control wall thickness. Screed rails on 10-ft centers are provided for striking off the crown. Forms for the back wall also are placed at this time.



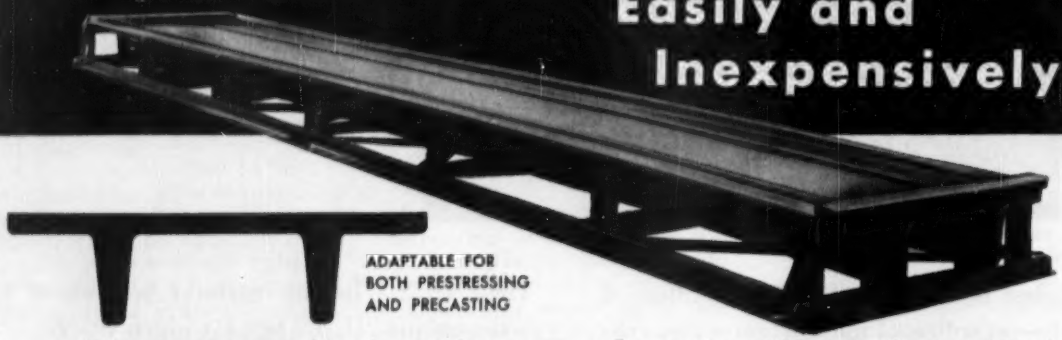
FRONT WALL FORMS are triangular-shaped to provide concrete retaining wings for earth blanket that will cover finished Yurt. Coosa Constructors made two huts daily this way.

Once side wall, crown, and back are poured, the truck traveler returns to beneath the form. Side panels are lifted and the form is freed. The truck then carries the form to a new yurt. The front wall next is poured.

This is built in the form of a vertical triangle to serve as retaining wall for an earth blanket that later is put over the top, sides, and rear of the magazine. Metal forms for this wall are placed by crane.

After the front wall is stripped, the yurt is covered with earth. The cover is 2-ft thick at the crown with slopes of 2:1 on both sides and the rear. Gravity ventilation and lightning protection are provided.

Precast Your Double Tee Slabs Easily and Inexpensively



ADAPTABLE FOR BOTH PRESTRESSING AND PRECASTING

It's not necessary to invest money in concrete beds, expensive equipment and plant facilities to manufacture prestressed double tee slabs. The bulk of these units are in the span range of 20 to 40 feet, for which prestressing has no advantage in strength or cost.

Low-cost, portable Atlas Cambered Steel Forms enable you to quickly and accurately precast your slabs with lightweight concrete. A small investment puts you in a business with a tremendous market.

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Manufacturers of Forms for Prestressed and Precast Concrete
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Three of 69 standard model 25-ton Dart Trucks—all equipped with Fuller 4-MS-1440, 4-speed Transmissions—owned by Southern Peru Copper Corporation. This is part of a $2½-million order for 90 units, one of the largest of its kind ever placed.

FULLER Transmissions specified on $2½ MILLION TRUCK ORDER!

The Southern Peru Copper Corporation has ordered a fleet of 69 standard model 25-ton Dart Trucks, *all* equipped with Fuller 4-MS-1440, 4-speed Transmissions. This is part of a $2½-million order for 90 units, one of the largest of its kind ever placed.

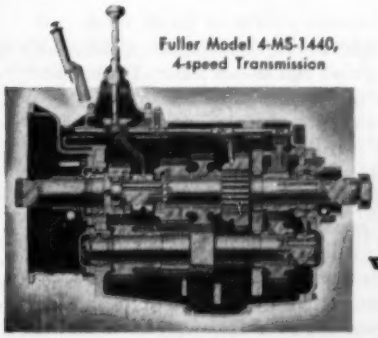
These trucks will be used for a dual purpose in the development of the huge Toquepala and Quellaveco copper deposits in southern Peru. First, they will help to remove the initial overburden, and later will haul copper ore from the open pits to the mine's concentrator.

The big, rugged, heavy-duty, off-highway Dart trucks—specifically developed for mining operations such as this—are designed and built to haul top payloads profitably, over the roughest terrain.

It is only natural then, that a dependable, durable, transmission was carefully selected to efficiently and effectively deliver power from the 335 hp Cummins N.R.T. Turbocharged diesel engine, through a Twin Disc Model CO Torque Converter. *That's why Fuller was specified!*

On job after job, where loads are the biggest and going is the toughest, you find Fuller Transmissions *putting horsepower to work efficiently and economically.*

Next time you order heavy-duty construction equipment, *specify* Fuller Transmissions. From over 110 models available for rubber-tired equipment, there's a Fuller Transmission designed to do *your* job.



Fuller Model 4-MS-1440, 4-speed Transmission

FULLER MANUFACTURING COMPANY
Transmission Division, Kalamazoo, Michigan

Unit Drop Forge Division, Milwaukee 1, Wisconsin • Shuler Axle Company, Louisville, Kentucky (Subsidiary) • Sales & Service, All Products, Western District Branch, Oakland 6, California and Southwest District Office, Tulsa 3, Oklahoma.

REMOVING FORMS FROM COMPLETED PIERS, Fruin-Colnon maneuvered their American 300 Series Truck Crane over temporary fill in the Missouri River. The complete project will require nearly 40,000 cubic yards of concrete and 16,000,000 pounds of steel! Total cost, including the approaches, will be $13,500,000.

BUILDING MISSOURI'S LONGEST BRIDGE

American Truck Crane With 105-Foot Boom Used On Approach Project

An $8,500,000 bridge spanning the Missouri River near St. Charles, Mo., is the longest bridge ever built in the state. It is four lanes wide, 4,082 feet long!

Fruin-Colnon Contracting Co., St. Louis, is building the 10-pier west approach substructure. The contractor used an American 300 Series Truck Crane equipped with a 105-foot boom. The 25-ton American easily reached to the top of the piers for the many lifting jobs required. Fruin-Colnon is also using this American on expressway projects in St. Louis.

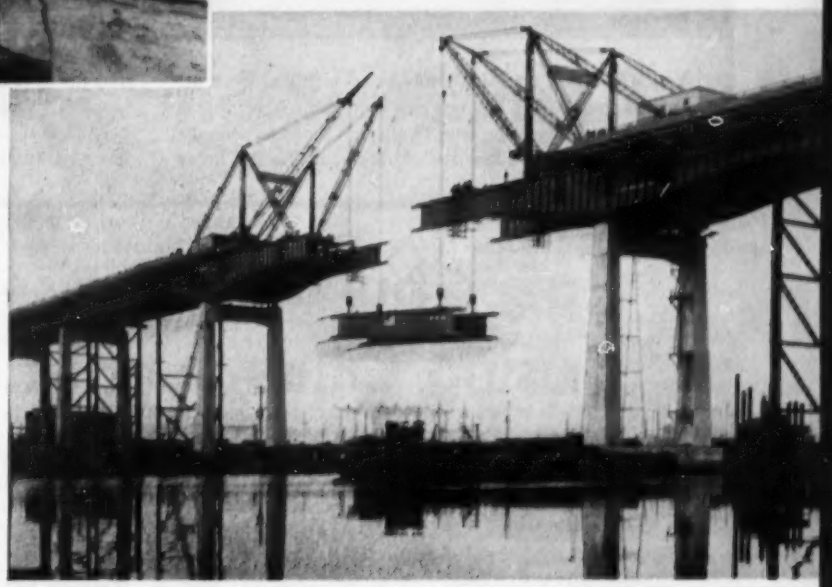
Contractors who shuttle truck cranes from job to job know that profits depend on "working" time. Travel and set-up time is non-profitable! It's an American Truck Crane's ability to finish a job and roll out on the highway in the shortest time that counts. Here's why they roll sooner: They fall within highway limits in width and weight in most states —special permits aren't needed. When it's necessary, the counterweight can be removed with the crane's own power and placed on a truck for hauling. The stronger, lighter weight pipe-laced boom features pin connections that speed up assembly-disassembly. And the 300 Series will easily raise 100 feet of boom plus 30 feet of jib right from the ground without help! If you're interested in all 'round profitable truck crane operation, see your American Distributor!

(Advertisement)

WIDENING U.S. HIGHWAY 40 is one of Fruin-Colnon's jobs on the St. Louis Expressway. Others include building a cloverleaf interchange, a bridge and a twin box culvert! Excavating for new pavement, Fruin-Colnon uses an American 100 Series Backhoe. This ½-yard machine, latest addition in the American line, offers really low overall operating cost—and a low initial cost, too. For a top-dollar value check the many advantages of this rugged new truck or crawler mounted American!

TO EXCAVATE AN OLD BUILDING FOUNDATION, J. Gallo Limited, Toronto contractor, used his American 700 Series Backhoe. The rugged construction of this crawler withstands the pounding of tough jobs like this—virtually eliminates unscheduled downtime! The high performance design plus smooth acting air controls boost hourly output—cut the cost per yard on every job! On rubber, this machine has a rated lifting capacity of 50 tons. Your American Distributor has complete details on this big series—visit him soon!

CLOSING THE GAP WITH A 290-TON GIRDER SECTION was done on this turnpike job with four American stiffleg derricks, each rated at 115 tons lifting capacity. Powered by American hoists, American guy, stiffleg, steel erector and barge mounted derricks perform outstanding lifting jobs in every industry. They're the backbone of American Crane design know-how—the big crane design that pays off on every job!



A CRANE THE RIGHT SIZE FOR YOUR JOB is available from American Distributors everywhere. This complete line offers bucket capacities from ½-yard to 2 yards, lifting capacities up to 50 tons! Your Distributor is trained to help you choose the proper type of power, boom length, jib, counterweights—give you expert advice on the many decisions that have to be made at the time of purchase! And you'll find skilled service facilities are available from your American Distributor too. See him for complete crane details and his part in the sales and service of American Cranes!

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WHOLE FLOOR OF BUILDING has been pulled loose by this crane of John J. Duane Company. To do it, workmen drove two holes in the floor (walls and roof had already been removed) and inserted cable down through holes and up to crane. Crane then tugged until floor ripped loose. This is typical of workout the firm's cranes receive, but using Cities Service lubricants they give flawless performance.

Razes buildings, raises efficiency using Cities Service lubricants

9000 hours on a crane and no trouble . . . truck goes 65,000 miles, uses no make-up oil

JOHN J. DUANE COMPANY, Quincy, Massachusetts, operates 10 cranes, 14 gasolene and diesel trucks, three forklifts, and a bulldozer . . . all powered and lubricated by Cities Service. The results are notable. Says John Duane: "Using Cities Service C-300 Motor Oil, one of our diesel cranes has gone 9000 hours with absolutely no trouble, and the oil has doubled the period between overhaul for our truck fleet. Furthermore, one gasolene truck has gone 65,000 miles without adding a drop of C-300 between crankcase drains. We're also mighty pleased with Trojan P-2 Grease. Used on the tracks of our cranes, Trojan P-2 keeps them operating flawlessly under the most severe conditions."

Like Mr. Duane, you'll lengthen overhaul periods, cut operating costs when you start using Cities Service products. Get all the facts from a Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

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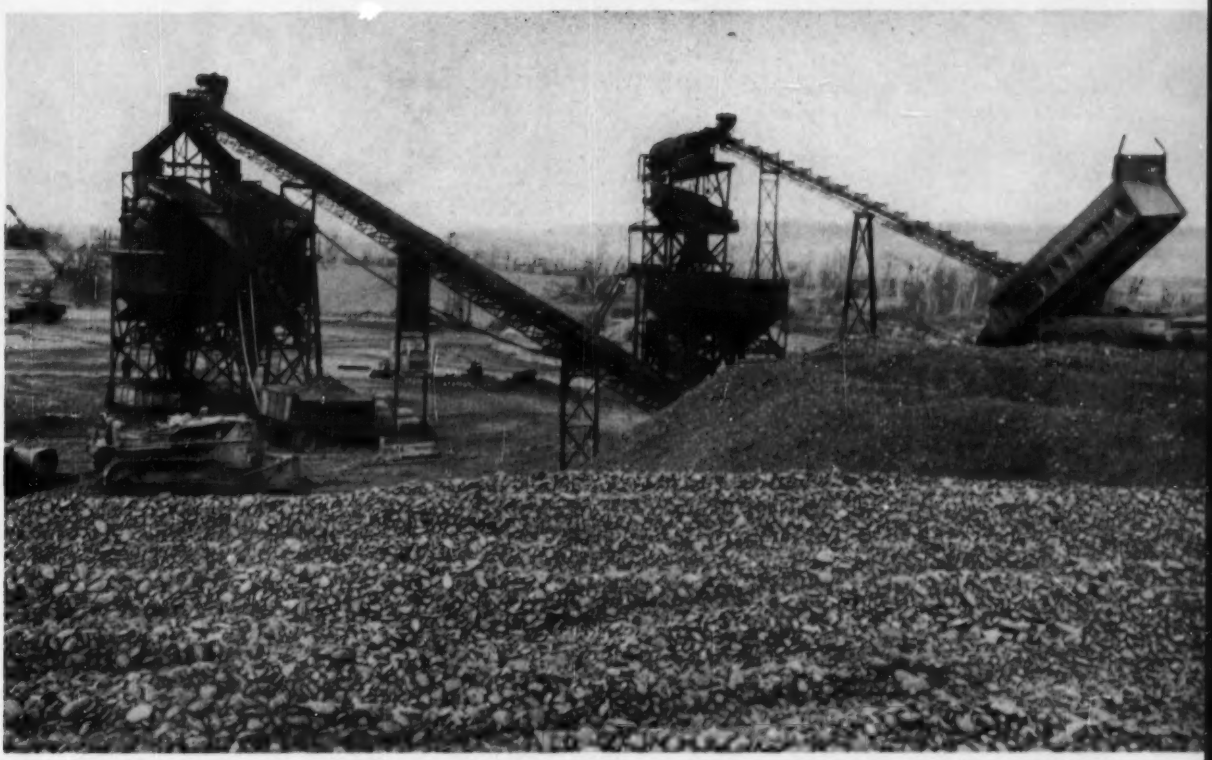


BIG SCREENING PLANT includes parallel sizing screens (left) and tandem washing and sizing screens (right). Northwestern Engineering Co., contractor from Rapid City, South Dakota, set this plant up for one of its jobs near Glasgow, Montana.

5. Screens and Screening

By W. A. RUNDQUIST,
Vice President
Pioneer Engineering Works, Inc.

TO MEET engineering specifications, construction aggregates must be screened at some stage of processing. That is, the material must be separated into selected particle size ranges. The equipment making such separation is generally called a screen, although the terms vibrator, shaker, or trommel may be used, based on the type of screen involved. When used as a scalper (see Chapter 2, Feeders and Their Application) a grizzly may be considered a screen. Grizzlies, however, are not generally applicable to sizing operations.

In screening operations, always keep in mind the particular problem at hand. For example, in the typical quarry plant installation referred to in Chapter 2, a two-deck screen might be used to produce two sizes of crushed stone. It would also provide for returning oversize material to the secondary crusher because as much as 15% of the material passing through the crusher may not be reduced to specification size (see Chapter 3).

Or refer to the portable plant illustrated in Chapter 2, which is designed for the production of one size material with provision for removal of excess sand. Here a 2½-deck screen is used. The material failing to pass through the top deck is fed to the primary crusher, while the material failing to pass through the second deck is fed to the reduction crusher. The combined material from both crushers is again routed to the top deck of the screen where the separation is repeated. Specification material consists of that material passing through the second deck, from which excess sand is removed by a half deck extending below.

In both cases we are concerned with two factors: the amount of material passing through a deck and the amount not passing, but retained on it. Further, for any given particle size there will be a limiting screen through which the particle will pass, and a retaining screen through which it will not pass.

Such factors, reduced to numerical values for particle size, become the basis for the engineering specifications covering construction aggregates. These are also the factors that permit determination of the quantities of material within any given size ranges produced by a crushing operation.

To be still more specific, take a typical specification for coarse ag-

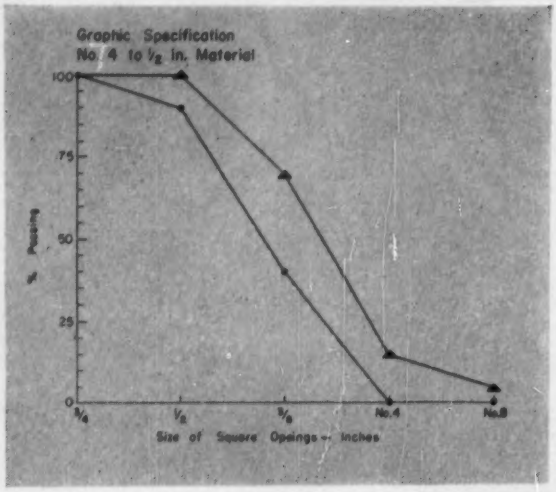
gregate for a portland cement concrete:

Designated Size: No. 4 to ½ in.	
Laboratory sieves; Square openings	% by weight passing laboratory sieves
¾ in.	100
½ in.	90-100
⅜ in.	40-70
No. 4	0-15*

*Not more than 5% shall pass a No. 8 mesh

While actual determination of conformance with the specifications would be made with laboratory sieves, this specification can be translated to mean that:

a) All material must pass through a screen of ¾-in. square openings.
b) Not more than 10% may be retained on a screen of ½-in. square openings.
c) At least 90% must pass the ½-in. screen and not more than 60% may be retained on a screen of ⅜-in. square openings. However, the material will meet specifications if only 30% is retained by the ⅜-in. screen.
d) Up to 15% of the material may pass through a screen having a No. 4 mesh (four openings per lineal inch of screen).



HYSTERESIS CURVE is graphical method of showing specification limits.

An accompanying "hysteresis" curve represents graphically the above specification. After making a sieve analysis of the material produced to meet this specification, it may be found that not all percentage values will fall within the limiting area of the two curves. Then it is necessary to correct the crushing-screening setup to bring the material into line with requirements. A subsequent chapter will detail these corrections.

In processing aggregates there are two distinct reasons for screening. One is for scalping to remove oversize or undersize material in connection with crushing operations. The other is to effect a complete sizing of the materials being produced. At times it is possible to combine scalping and sizing in the same screen, as for example ahead of a primary crusher in gravel, or a secondary crusher in quarry rock. Recent quarry practice, too, has trended toward scalping and some sizing ahead of the primary.

Continued on page 100

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If you want *circulated warm air* indoors, *powerful spot heating* outside, if you want to *dry plaster,* pour and *cure concrete* and *keep the job rolling* in any weather, you need a Master heater.

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Screening Classification

Because the size of material to be screened will in large measure determine the techniques most satisfactory for doing the job, screening should be classified as:

1. *Fine Screening*
2. *Medium Screening*
3. *Coarse Screening*

What sizes of materials fall within these classifications must be set somewhat arbitrarily, to be sure. However, with the screening of construction aggregates:

Fine screening refers to materials below ½ in.

Medium screening (sometimes called average screening) refers to materials from ½ in. up to 4 in.

Coarse screening refers to materials above 4 in.

These definitions are based on common practice where multiple deck screens are now used between stages of crushing and behind the last reduction crusher. It is not uncommon to have a multiple-deck screen on which the top deck has 4-in. openings and the bottom deck ½-in. openings. Nor is it uncommon to produce ½-in. material and sand on two decks of one screen.

However, the experienced operator knows that neither highest capacity nor best efficiency in separation will result when attempting to screen both fine and coarse materials on the same screen. It is a practice much in use in a great many plants, nevertheless, often for good and practical reasons.

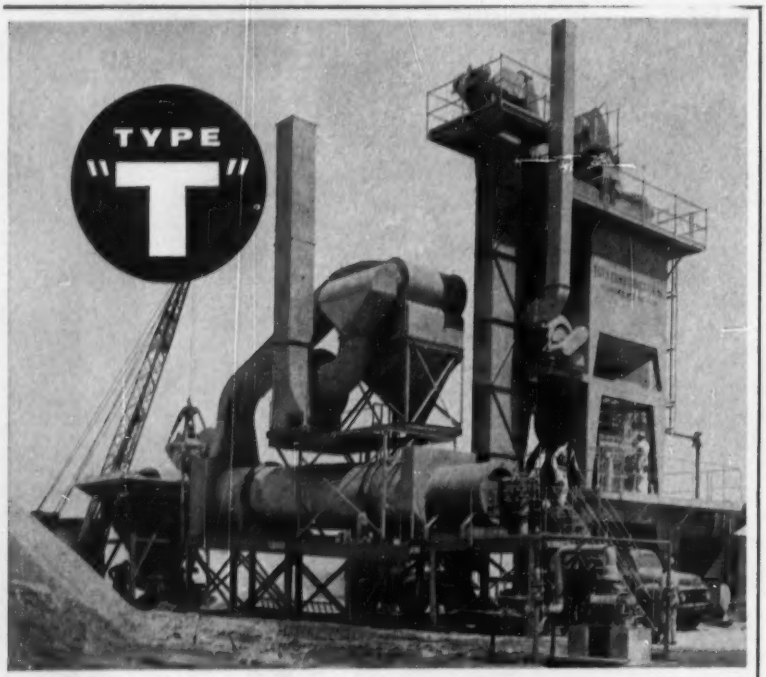
Now, what are some of the differences in operation to be kept in mind? Perhaps these are best explained by reference to the inclined vibrating-type screen, mainly because of its wide use.

As a rule, fine screening should be done on a screen having a rather high speed of shaft rotation, with a fairly short eccentric throw, at a relatively steep slope of the deck. For medium or average screening the speed of shaft rotation should be reduced, the eccentric throw increased slightly, and the slope should be somewhat less. For coarse screening or scalping operations the shaft rotation should be still further reduced, the eccentric throw increased still more, and the slope maintained at or near that for medium screening. Often some experimenting with the slope and

Operating Characteristics of Typical Vibrating Screens

Class of Screening	Size of Screen	No. of Decks	Stroke (In.)	Speed (RPM)	Slope (Deg.)
Fine	3 x 10	2 & 3	3/16	1150	15-20
Fine	4 x 12	3	3/16	1150	15-20
Medium	3 x 10	2 & 3	¼	1150	10-15
Medium	5 x 12	2 & 3	¼	900	12-17
Coarse	4 x 10	2	⅜	900	10-15
Coarse	6 x 14	2	⅜	800	12-17

SCREENING CLASSIFICATION determines how screen should be operated.



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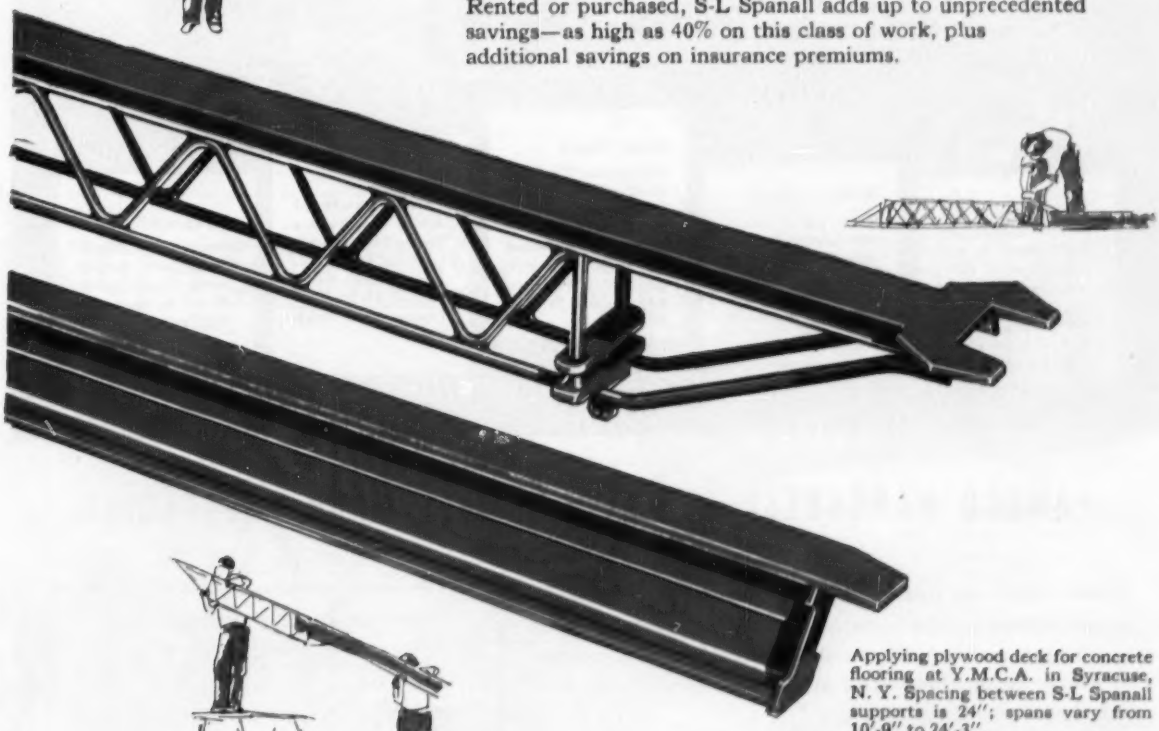
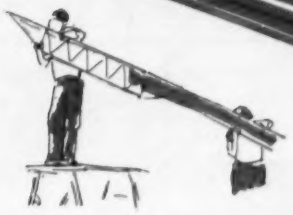
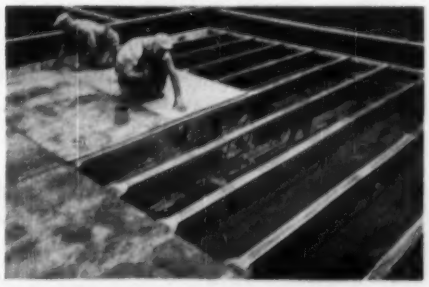




Applying plywood deck for concrete flooring at Y.M.C.A. in Syracuse, N. Y. Spacing between S-L Spanall supports is 24″; spans vary from 10′-9″ to 24′-3″.



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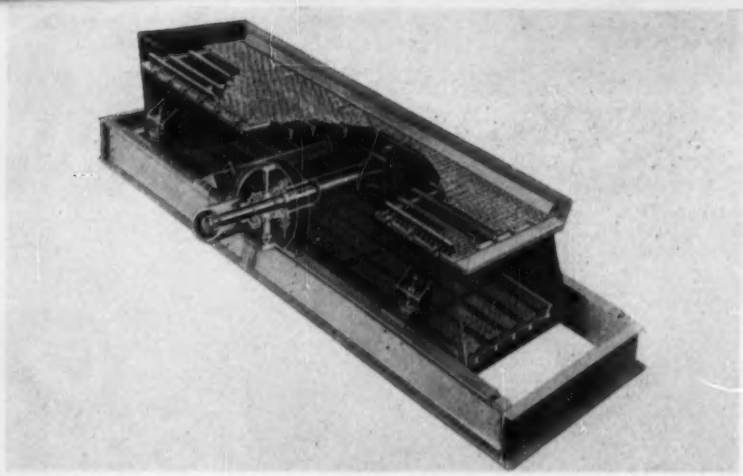

INCLINED VIBRATING SCREEN of four-bearing type has two bearings supported by frame, in addition to two attached to screen pan. They give positive throw. (Pioneer photo)

PRODUCING AGGREGATES . . . **continued from page 100**

speed may be necessary before optimum performance is attained. Because the degree of slope of the screening surface is an important factor, it is not uncommon to find a steeper slope of the sand deck (bottom deck) in a two- or three-deck screen, than in the upper decks where coarser materials are handled.

Typical screen-bed sizes in the accompanying table indicate clearly these differences in recommended operation.

Types of Screens

While there are screens of many types and descriptions for a multitude of uses, three basic types are important to the aggregates producing industry:

Inclined vibrating
Improved horizontal
Revolving

Inclined Vibrating Screens

There are two important categories of the inclined vibrating screen, distinguished primarily by the number of bearings on the rotating shaft. They usually are referred to as "two-bearing" and "four-bearing" screens.

The two-bearing screen has one bearing on each side of the screen pan, but none supporting the shaft on the main frame. Circular motion of vibration is imparted by the centrifugal force of an eccentric portion of the shaft, or by weights.

The two-bearing screen is a smooth-running screen because a spring or rubber mount isolates it from the main frame. When a load of material is applied to a two-bearing screen, the amplitude of vibration (the throw) is dampened somewhat. Theoretically it is possible to load a two-bearing screen to the point where the screen will stand still and the shaft will vibrate. Practically, of course, two-bearing screens are built so that no such load will be applied. Under normal conditions, the two-bearing screen does a good job.

Continued on page 106

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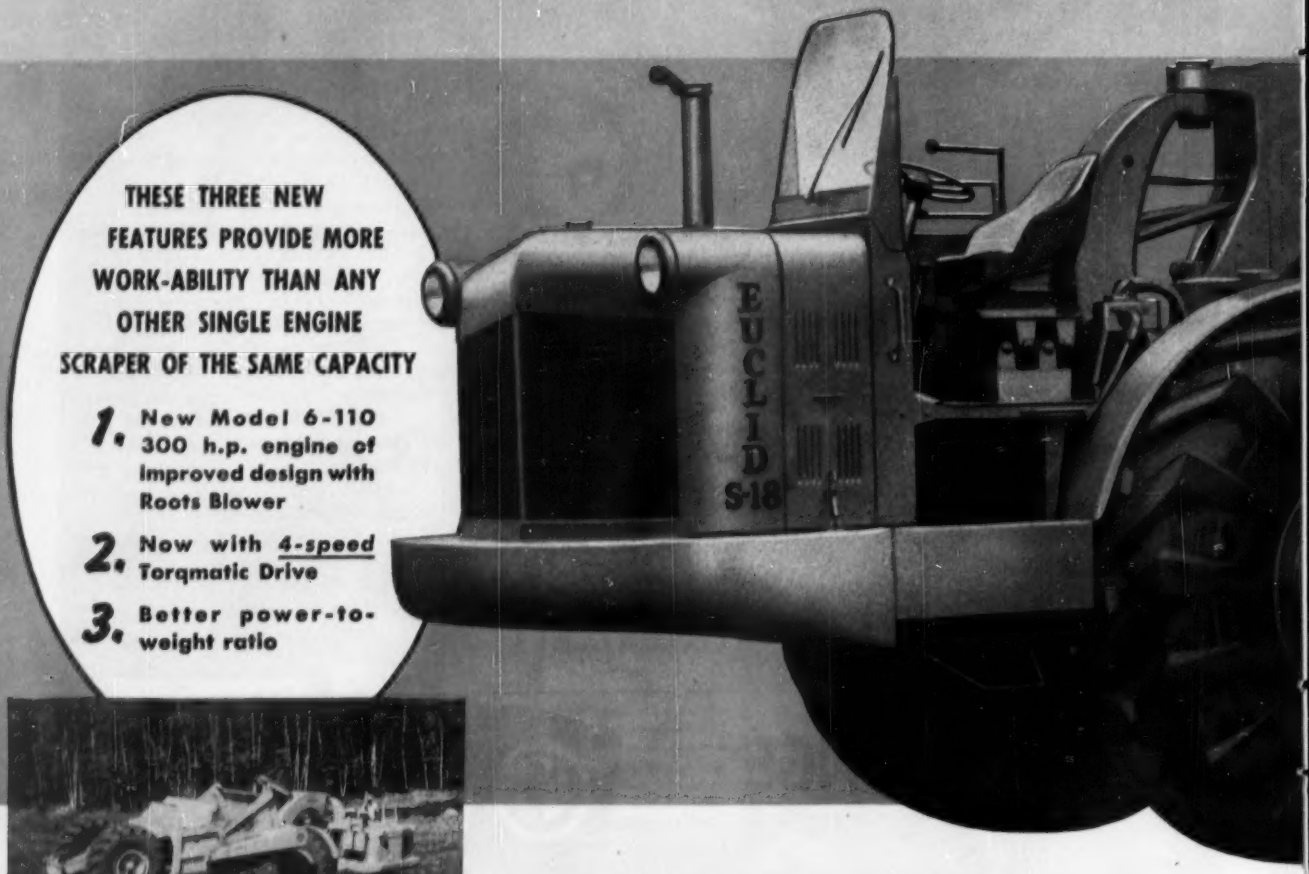
THESE THREE NEW FEATURES PROVIDE MORE WORK-ABILITY THAN ANY OTHER SINGLE ENGINE SCRAPER OF THE SAME CAPACITY

1. **New Model 6-110 300 h.p. engine of improved design with Roots Blower**
2. **Now with *4-speed* Torqmatic Drive**
3. **Better power-to-weight ratio**



Improved full hydraulic steering gives the S-18 still better maneuverability and ease of handling. In spite of its size, this scraper makes a non-stop turn in only 36′. Hydraulic lever action of bowl, apron and ejector eliminates down time caused by cable breakage.

Torqmatic Drive with new 4-speed semi-automatic transmission, 300 h.p. engine, big tires, NoSpin differential and low, wide bowl provide fast, easy loading in any scraper material. The 4 section cutting edge is reversible and interchangeable—it's adjustable for varying job conditions.

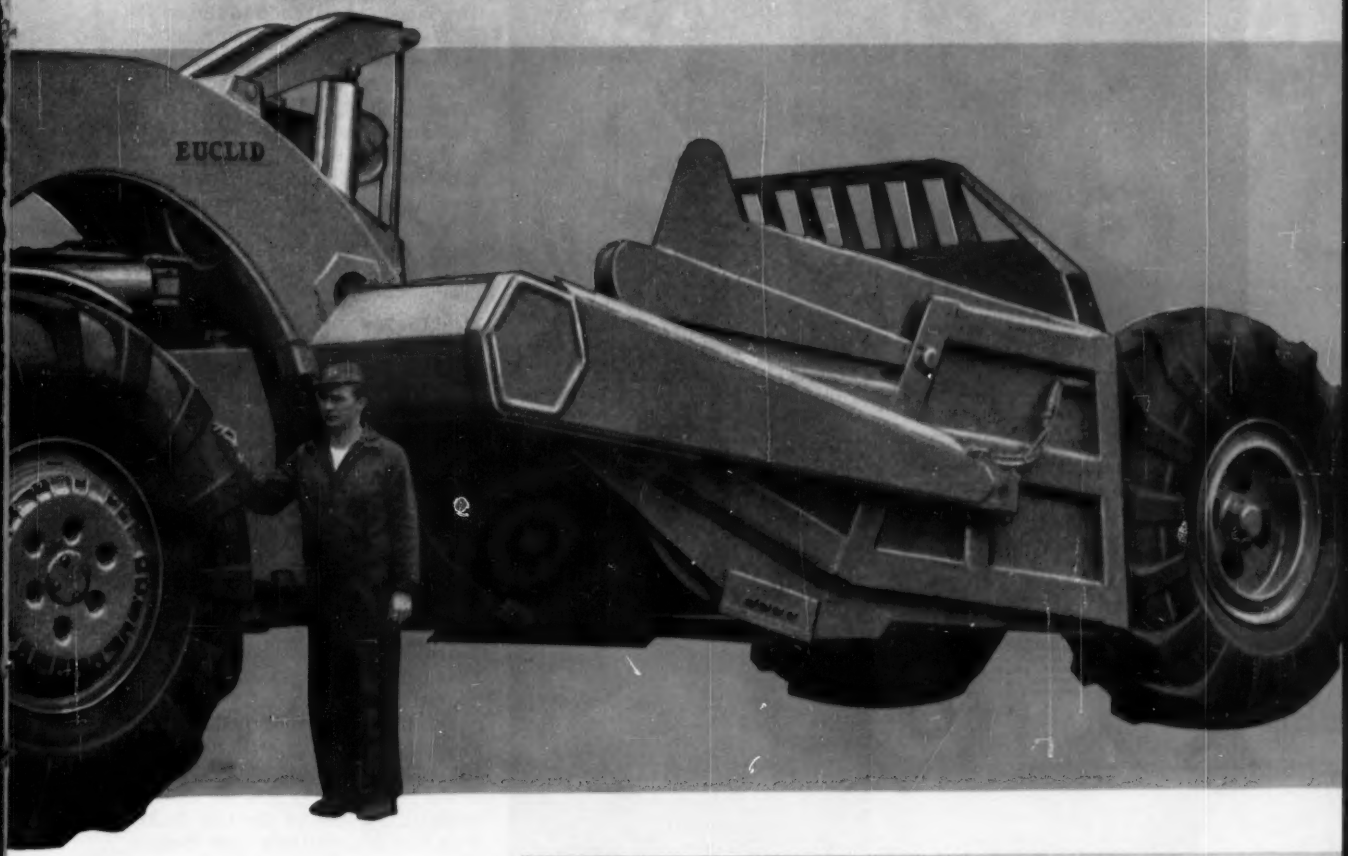
A big machine for big jobs, the Model S-18 Euclid Scraper has proved its ability to outperform comparable scrapers in productive capacity and low cost yardage. Now it has even more built-in performance with an improved power-to-weight ratio, and easier operation and accessibility than before. This new S-18 will surpass its previous high production records.

The improved 300 h.p. engine and new 4-speed Torqmatic Drive give still better performance in the lower speed ranges that are so important to efficient scraper operation. Simplified design of the engine with the Roots Blower reduces maintenance time and costs and gives more durability and fuel economy. With the 4-speed semi-automatic transmission there's a better range of speed and torque for every scraper power requirement . . . from the maximum torque needed for loading to the higher speeds used on the haul road.

Already preferred by many leading contractors because of its greater work-ability, this new S-18 incorporates many important improvements. Your Euclid dealer will be glad to explain these new features and cost-cutting advantages and show you why ***Euclids are your best investment.***

See the new S-18 at the Road Show!

the improved EUCLID S-18 SCRAPER



Faster cycle time with Torqmatic Drive—there's no clutching or loss of speed when changing from one speed range to another. Top speed with heaped loads up to 25 yds. is over 20 mph. Short overhang of the engine gives good stability for rough going and long, high speed hauls.

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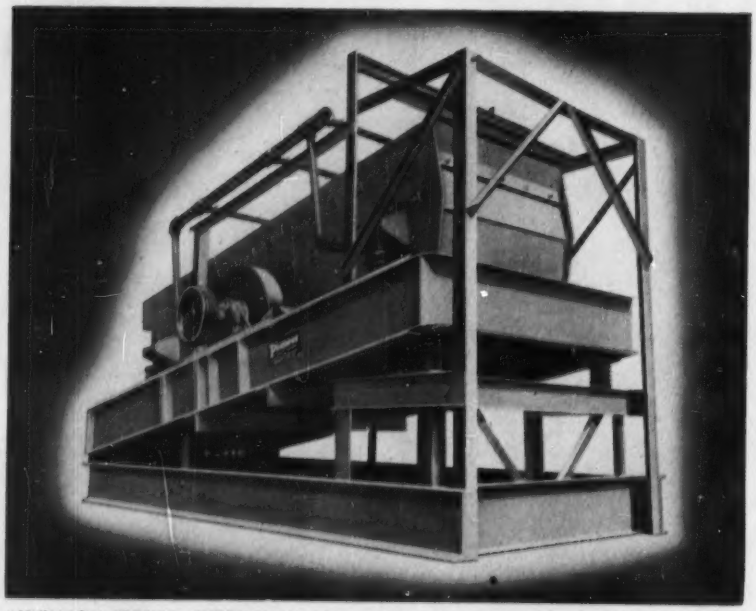
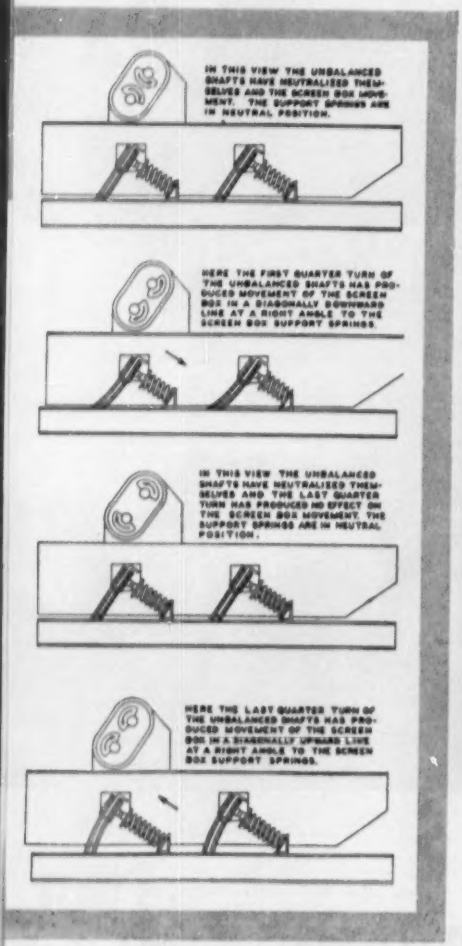
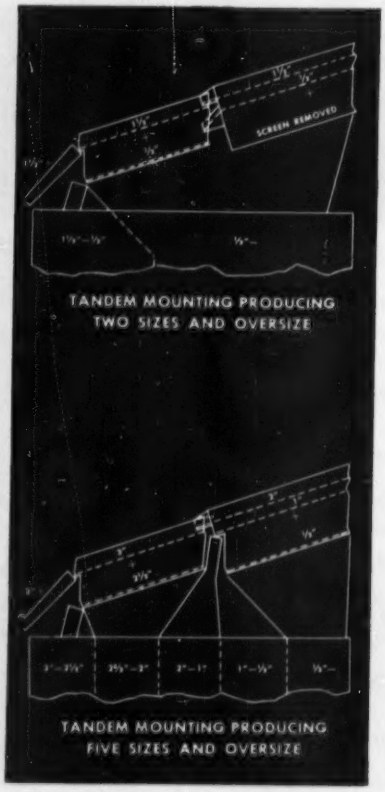


AUXILIARY SPRING SUSPENSION eliminates transient vibration of inclined vibrating screen, here shown equipped with spray pipes and conveyor mounting. (Pioneer photo)


IN THIS VIEW THE UNBALANCED SHAFTS HAVE NEUTRALISED THEMSELVES AND THE SCREEN BOX MOVEMENT. THE SUPPORT SPRINGS ARE IN NEUTRAL POSITION.
HERE THE FIRST QUARTER TURN OF THE UNBALANCED SHAFTS HAS PRODUCED MOVEMENT OF THE SCREEN BOX IN A DIAGONALLY DOWNWARD LINE AT A RIGHT ANGLE TO THE SCREEN BOX SUPPORT SPRINGS.
IN THIS VIEW THE UNBALANCED SHAFTS HAVE NEUTRALISED THEMSELVES AND THE LAST QUARTER TURN HAS PRODUCED NO EFFECT ON THE SCREEN BOX MOVEMENT. THE SUPPORT SPRINGS ARE IN NEUTRAL POSITION.
HERE THE LAST QUARTER TURN OF THE UNBALANCED SHAFTS HAS PRODUCED MOVEMENT OF THE SCREEN BOX IN A DIAGONALLY UPWARD LINE AT A RIGHT ANGLE TO THE SCREEN BOX SUPPORT SPRINGS.



TANDEM SCREENS are used to increase screening area or to separate many sizes.

IMPROVED HORIZONTAL SCREEN is vibrated by pair of revolving weights attached to shaft. This gives high-speed screen motion with shorter stroke.

For full screening capacity and high efficiency, it is hard to beat the four-bearing inclined vibrating screen. This is a positive-throw screen because, in addition to the two bearings attached to the screen pan as in the two-bearing screen, it has two additional bearings. These carry the outer ends of the rotating shaft and are supported on the main frame. So long as the shaft can be turned, no amount of load on the screen can change the length of throw or amplitude of vibration.

One of the exasperating problems experienced with four-bearing screens has been a tendency, under some operating conditions, to transmit some vibration to the supporting structure. Recent developments in screen suspension have remedied this situation, so that the four-bearing screen may now be accepted as one of the smoothest running screens.

Improved Horizontal Screens

The old shaker screen, popular a number of years ago because of its high efficiency in close separation, has its counterpart today in an improved type of horizontal screen. This newer screen has a vastly improved capacity.

The higher capacity is due to the mechanism that imparts motion to the screen. This is now a high-speed motion with a much shorter stroke than that of the old shaker with its comparatively slow motion. The motion of the new horizontal screen is imparted by a pair of revolving weights that oppose each other half the time, and aid each other the other half. This change takes place every 90 deg of shaft rotation.

Because the horizontal screen moves rapidly back and forth in an arc, a heavy main frame supports the screen pan. The object is to take advantage of the heavy mass and inertia of the frame to help prevent transmission of motion to the supporting structure.

Generally, the horizontal screen requires less head room than the inclined vibrating screen. The horizontal screen is not too well adapted to scalping performance.

Revolving Screens

A revolving screen is, in effect, a large drum whose side plates are perforated. Material placed inside passes through the perforations as the drum rotates on its longitudinal

Continued on page 109

Twin Disc Torque Converters on 14 new Darts provide full hp output, automatic downhill braking!

One of fourteen new Dart Model 25SL, 25-ton end dump trucks, built for the Reynolds Haitian Mines, Inc. Equipped with Cummins NHRBS-600 Diesel Engines, driving through Twin Disc Model CO Torque Converters and Fuller 4MS1440 4-speed Transmissions—the trucks will haul bauxite ore in Haiti.

In building fourteen new Model 25SL, 25-ton end dump trucks for Reynolds Haitian Mines, Inc., Miragoane, Haiti—the Dart Truck Company *standardized* on Twin Disc Model CO, Three-Stage, Truck-Type Torque Converters. This specifically met Reynolds' requirement for a retarding device that would eliminate use of regular service brakes on downhill runs.

These new Darts will carry bauxite ore from the mines located on the plateau above Miragoane, Haiti. The average 8-mile haul (with some as long as 11 miles) is completely downhill, encountering grades varying from 0 to 11%—with an average grade of approximately 5%.

On one of three trucks already delivered to Miragoane—it has been reported that the converter, with its automatic braking, *holds the loaded (97,000 lb.) truck down to 25 mph on an 11% grade.*

Engineered specifically for operations of this kind—the Model CO multiplies torque input up to 6:1. It provides converter downhill hydrodynamic braking action automatically —whenever the accelerator pedal is retarded, by engagement of the new, heavy-duty truck-type 6" freewheel. With this special *built-in* braking feature, braking effort can actually be exerted *up to 90%* of the engine's rated horsepower.

Twin Disc also offers the Model DF Truck-Type Torque Converter, which also features Converter Braking, and Lock-out Drive for flat, straightaway runs, where fuel-saving benefits of direct mechanical drive can be utilized at high speeds.

Whatever *your* operation—short, steep hauls, or longer, straight runs—Twin Disc has a three-stage, truck-type torque converter to *exactly fit your needs.* Write for Bulletin 501-A.

TWIN DISC

TWIN DISC
Torque Converters

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division) Rockford, Illinois

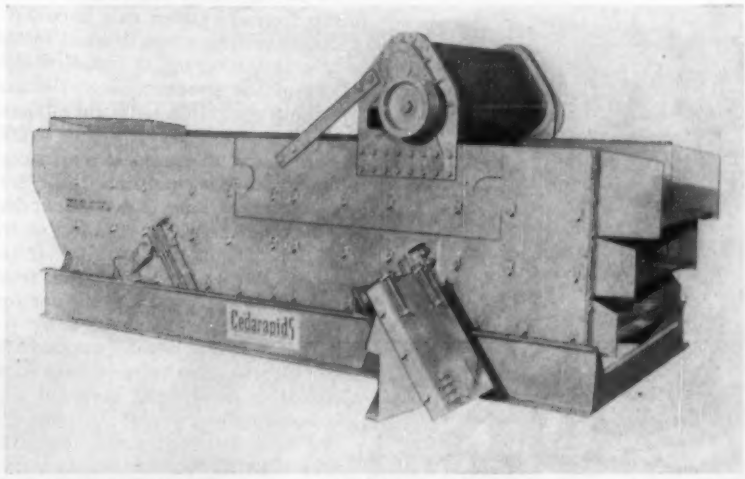
SINCLAIR PRODUCTS TO BE USED ON FIRST JOB AWARDED UNDER FEDERAL AID HIGHWAY PROGRAM

The first interstate system contract award made in the entire United States under the 1956 Federal Aid Highway Program has gone to the Koss Construction Company at Des Moines, Iowa. They use Sinclair Fuels and Lubricants exclusively. This important "first" involves 13.28 miles of 24-foot concrete pavement in Laclede County, Missouri.

Koss Construction uses assembly line techniques geared to tight production schedules. To help maintain these schedules they have used Sinclair lubricants for over fifteen years.

It's smart management to switch to the lubricants that can help keep your bid low by keeping your equipment constantly on the job. Phone your local Sinclair Representative or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. *There's no obligation.*

SINCLAIR LUBRICANTS



VIBRATING MECHANISM of this three-deck improved horizontal screen is housed above top deck, will be operated by multiple V-belt drive from electric motor. (Iowa photo)

axis. In many applications the side plates are made of wire mesh instead of punched plate. Around the periphery of these screens are cast rings that ride on trunnions, and they are driven by a bevel gear and pinion usually located at the discharge end. The rate at which the material moves over the screen from feed to discharge end is governed by the axial inclination of setup.

As a rule, revolving screens give excellent control of separation but they have relatively low capacity for their bulk. They can be equipped with a number of sections of different size screen openings, hence can be used for multiple separations. Further, they can be equipped with sand screens (a second screen around an inner screen) and also with rock jackets (a solid drum around the inner screen). They have wide adaptability to limited production of various sizes of aggregates in gravel applications.

The revolving screen makes a good washing plant for moderate quantities of clean, sized aggregates. A scrubber is set ahead of the screening section, attached to the latter and turning with it, and the screen is equipped with a water spray.

To determine the effective screening area for calculating capacities of the revolving screen, it is usual to figure one-third the diameter multiplied by the length of screen.

While the revolving screen has been in use for a good many years, its popularity is waning in spite of the fact that it is considerably cheaper than the inclined vibrating or horizontal screen. It finds its most extensive use today in low cost washing plants.

Most common sizes are 30-, 36- and 42-in. dia, in lengths from 12 to 20 ft. They are available, however, in dia up to 60 in.

Screen Combinations

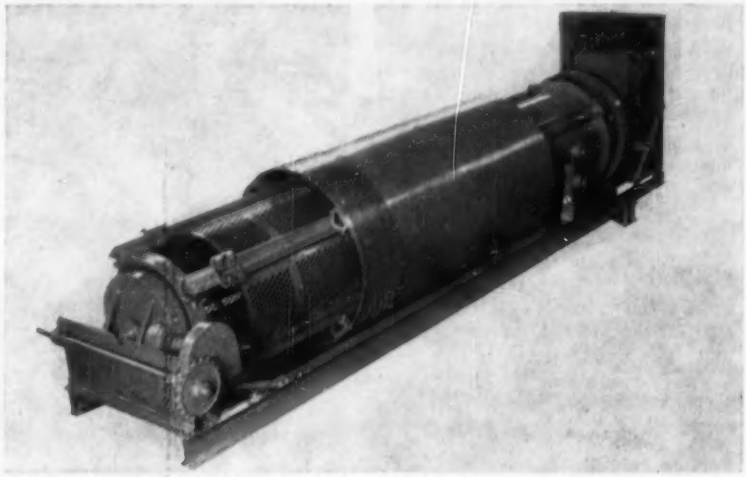
Screens are not always used singly, even though they may be equipped with decks for multiple sizing. In aggregates production, a 6x16-ft inclined vibrating or horizontal screen would be considered large indeed. In the majority of installations where screening area larger than that of a 5x12-ft screen is required, screens will be arranged in parallel, tandem or a combination of both. Parallel arrangements are used where the feed from a crusher will be split between the two screens. Tandem-built screens have proved popular (1) where there may not be enough screening area on one screen for a particular size of material, but ample area for another size, or (2) where considerable variance in the amounts of specific sizes of materials is wanted.

Feeding Material to Screens

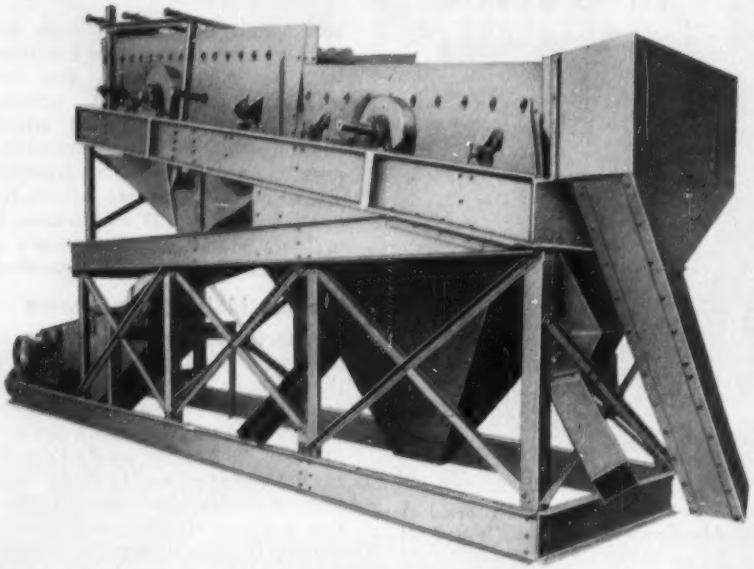
A factor often overlooked on an otherwise well planned setup is the manner in which material is fed on to the screen. More screens are fed by conveyor than by any other method; next would rank by bucket elevator; and lastly by some type of feeder. Regardless of how the material is delivered to the screen, it should not be dropped from a high point on to the screen cloth, especially if it contains large rock. Such procedure causes unnecessary wear and tear on the screen. And material bounces at the beginning of screening, with resultant loss of screening area.

It is much better practice to discharge the oncoming material into a feed box so that it will drop easily on to the screen cloth. The feed box lets the material spread evenly over the screen while at the same time wear of the screen cloth is reduced. An alternative is to provide a feed pan of solid plate on the screen bed at the point where the material is dropped.

When feeding an inclined screen by conveyor, it is customary to locate the conveyor over the screen. That is, material on belt and screen travel in opposite directions.



TYPICAL REVOLVING SCREEN fitted with sand jacket is driven by enclosed bevel gear and pinion at lower, or discharge, end. They cost less than vibrating type. (Pioneer photo)



TANDEM SCREEN MOUNTINGS can be fitted with various features. This one includes spouts, chutes, hoppers, discharge of fines to sand drag. (Pioneer Engineering Works photo)

When conveyor-feeding a horizontal or revolving screen, the conveyor usually is located so that the material comes up in the same direction it flows over the screen.

Heated Screens

Screening of fine materials having a tendency toward stickiness, with resultant clogging and blinding of the screening surface, has long been a headache to operating men. Specially designed wires and weaves for screen cloth, and various mechanical "bumpers and thumpers" have been found helpful in cases. Perhaps the most effective recent development for overcoming this problem is the heated screen.

In the heated screen a low-voltage, high-amperage current is passed through the wires of the screen cloth. The wires' high resistance to passage of the electricity makes them hot—anywhere from 100 to 300 deg. Naturally, this temperature is not high enough to dry out the material passing over the screen. The function of the heat is to dry the sticky material adhering to the wires so that it cakes and breaks loose, thus keeping the mesh openings clear. So far, successful operations with heated screens down to 20 mesh have been reported.

Screen Installation

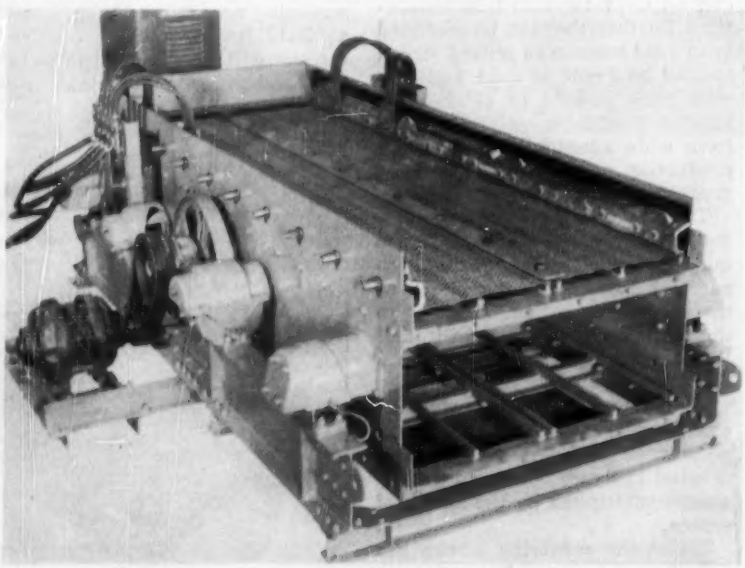
Vibrating screens may be suspension mounted or floor mounted. For the former, the four corners of the screen frame are attached to cables or rods which hang down from some kind of beam support. A compression coil spring at the upper end of each hanger absorbs shock and effects as much insulation as possible against transient vibration.

For floor mounting, the screen frame is set on sills of some kind (which actually might be a part of the frame). Often this is called a bin mounting, since in most installations the screen is installed over one of the product bins. Because smooth operation with unrestricted screen motion are requisites to efficient material separation, an auxiliary spring suspension built into the screen frame is recommended.

Regardless of the method of installation, it is important that the screen be level across the front and back and that the proper operating angle, as specified by the manufacturer, be maintained. If the screen is not transversely horizontal, a simulated state of unbalance will exist and material will not be distributed evenly over the screen surface.

Other factors affecting screen installation include:

- **Aprons and chutes**—Do not attach them directly to the screen pans as this throws the screen out of dynamic balance. An out-of-balance screen is low in efficiency and may even vibrate itself to pieces.
- **Screen cloth**—Keep it taut by keeping the clamp bolts tight. A taut screen gives more efficient separation and greatly prolongs the life of the woven wire cloth.
- **Punched metal plate**—When it is used (for example, on the top deck in coarse screening) build up, by welding, the longitudinal slide bars (between punched holes) as they wear. This helps prevent early



HEATED VIBRATING SCREEN can handle moist fines. Low-voltage high-amperage current is passed through wires of screen cloth to heat them and prevent clogging. (Tyler photo)

GREAT NEW IDEA in tractors and attachments

52 hp **Model 404** with ½-yd. loader works as primary equipment . . . as backup machine . . . as utility or cleanup tool. Tractor is available with either gasoline or diesel engine.

42 hp **Model 303** with angle-dozer and rear-mounted backhoe provides ideal means to clean up after main-line or intermediate machines . . . keeps equipment costs relative to job.

34 hp **Model 202** and backhoe — 5 sizes, 12" to 36" buckets. Swings 180°. Ideal for scattered "work and run" jobs — anywhere. Digs to depth of 13 ft.

M-H-F WORK BULLS

Now from one source . . . a package of 5 versatile, low-cost tractors with 20 power-matched attachments

Work Bulls pay off as primary equipment . . . as backup machines . . . as utility or cleanup tools.

They help you rake in a bigger payoff on all projects . . . put money-draining manual-labor jobs on a profitable basis . . . knock the rough edges off tough jobs for medium-priced, single-purpose units . . . free mainline machines for high-profit, heavy equipment assignments exclusively.

Built to "construction standards," Work Bulls are always ready for rugged duty . . . require little maintenance. And remember, you deal with *a single* retail distributor for sales and service on both tractors and attachments. One source, one responsibility — a definite advantage for you.

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42 hp **Davis Pit Bull** features torque converter . . . "foot-shift" direction changes . . . five speeds forward, five reverse. Frequently outworks more expensive, single-purpose rigs.

Fork Lift **Model 202** lifts 4000 lbs. with 10 ft. mast, has extension with 21 ft. reach for lighter loads.

M·H·F WORK BULLS

Division of Massey-Harris-Ferguson, Inc.

20-L Quality Avenue • Racine, Wisconsin

PRODUCING AGGREGATES . . . continued

wear of the punched plate itself.

• **Power**—Be sure it is sufficient to start the screen under all conditions of load and air temperature. If electrically powered, a high-torque motor is recommended.

• **Drive**—In connection with the drive, be sure that sheave or pulley ratios are correct to insure proper speed of shaft rotation. Practically all screens are balanced by the manufacturer prior to shipment, with the shaft running at specified speed. A speed different from that at which the screen was balanced will cause some vibration to be transmitted to the main frame. This reduces efficiency, lowers capacity and increases wear. The speed can be checked by a tachometer or by a revolution counter and watch.

• **Location**—Avoid installing the screen in a spot that makes changing screen cloths difficult. Provide ample walking room around the screen so it can be inspected, adjusted, and serviced.

• **Maintenance** — Follow the manufacturer's recommendation on lubrication. Such lubrication has been tested and found to be satisfactory.

Screen Efficiency

In the past, screen efficiency (or, as it ought to be put, efficiency of screening) perhaps has not been given enough attention when processing construction aggregates. However, materials engineers are now writing tighter specifications for the end product and it can be expected that this policy will be continued with even greater diligence. Thus, the producer or contractor should become more familiar with this often times misunderstood term—efficiency.

In many cases, efficiency of screening is confused with the ability to handle or separate out large quantities of various sizes of aggregates. That is incorrect.

Efficiency refers to the ratio of the amount of undersized material that goes through the screen to the total amount of undersized material in the feed. (As such, capacity is merely incidental. It becomes a factor only as it is great enough to provide the square-foot area required to produce the efficiency desired.)

Continued on page 114

STANDARD OPENING WITH RECOMMENDED SIZE WIRES

(When two sizes of wire are shown for one opening, the larger is generally used)

SQUARE OPENING WIRE SCREEN

Space or Clear Opening		Diameter of Wire	
Fractions of an inch	Decimals of an inch	Washburn & Moer Gage	Decimals of an inch
10 x 10 Mesh	.07	22	.0286
8 x 8 Mesh	.09	20	.0348
6 x 6 Mesh	.126	19	.041
5 x 5 Mesh	.153	18	.0475
4 x 4 Mesh	.196	17	.054
3 x 3 Mesh	.27	16	.0625
5/16"	.3125	10	.135
⅜"	.375	13	.092
⅜"	.375	9	.148
7/16"	.4375	8	.162
½"	.5	10	.135
½"	.5	7	.177
⅝"	.625	6	.192
¾"	.75	6	.192
¾"	.75	5	.207
13/16"	.8175	5	.207
⅞"	.875	5	.207
⅞"	.875	4	.225
1"	1.0	¼"	.25
1⅛"	1.125	¼"	.25
1¼"	1.25	¼"	.25
1¼"	1.25	5/16"	.3125
1⅜"	1.375	5/16"	.3125
1½"	1.5	¼"	.25
1½"	1.5	5/16"	.3125
1¾"	1.75	¼"	.25
1¾"	1.75	⅜"	.375
2"	2.0	5/16"	.3125
2"	2.0	⅜"	.375
2¼"	2.25	7/16"	.4375
2½"	2.5	7/16"	.4375
2¾"	2.75	7/16"	.4375
3"	3.0	½"	.5
3½"	3.5	½"	.5
4"	4.0	½"	.5

TRI-LOCK WIRE SCREEN

⅛" x 2" oblong opening	12	.105
3/16" x 3" oblong opening	10	.135
¼" x 3" oblong opening	9	.148
⅜" x 4" oblong opening	7	.177

Convert gravel pit to Drive-In theater site

Matched speed and traction of big rubber tires on pusher and scraper unit speeded up cycles. Single Tournatractor replaced 2 crawlers on this push-work.

Dallas movie-goers now watch current films at a new drive-in theater which was, until recently, a worked-out and abandoned gravel pit. Theater programs could read: "Earthmoving by George O. Walker Construction Co., Dallas, Texas".

Filling and leveling a gravel pit is a unique way to build a theater — but Texans like to do the unusual. So Walker moved in...loaded, hauled, and spread 120,000 yds. of sand and caliche to turn the irregular hole-in-the-ground into an attractive theater setting.

To move this yardage, Walker used a LeTourneau-Westinghouse team of 5 D Tournapulls and 1 208 hp rubber-tired C Tournatractor.

Filled from old spoil banks

Fill for the pit was obtained by cutting down most of the banks, together with old spoil piles on the property, to form a symmetrical amphitheater. First a dozer leveled off the steepest spoil ridges on the borrow section...then Tournapulls moved in for the king-size dirtmoving task.

Averaging 5-yd. loads per trip, the "D's" loaded on banks...hauled down into pit for spread. Returning, Tournapull operators handled their own haul-road maintenance, by dropping scraper's blade to smooth out haul route.

2,400-ft. cycle in 3 min. 22 sec.

On a cycle distance of 2400', "D's" averaged 3 min. 22 sec. Rigs loaded in 20 sec., over a 60' distance. Loaded Tournapulls completed 1120' haul in 1 min. 36 sec., returned in 1 min. 16 sec. Spreads over a 100' distance, took 10 sec.

Dirtmoving was done during the winter months, when rains and cold weather made work difficult. Yet Tournapull production remained steady under all weather conditions. When an unusual 4" snowfall hit Dallas, for example, it interrupted work for only half a day. When the storm was over, rigs had no trouble operating; in snow.

Out-perform comparable scrapers

Superintendent J. K. Mason had this to say about his D Tournapulls: "In my opinion, Tournapulls will outperform any similar equipment on the market today. They will out-turn them, out-run them, and load faster! Anything you can get into a 'D' you can get out fast — and that's more than you can say for many other scrapers."

Owner George Walker found that his one Tournatractor handles the pushing job which formerly required 2 crawler-pushers. "This rubber-tired tractor is much less expensive to operate than crawlers," he stated. "Maintenance and upkeep costs, both for D Tournapulls and Tournatractor, are low."

Now 9 yards heaped

The improved D 'Pull, now available, has 7.3 cu. yds. struck capacity and 9 cu. yds. heaped. With its narrow 8' width, and axle-loads within allowable weight limits, rig is roadable without special permit. Write for details. Find out how this machine can make profits for you.

Tournapull, Tournatractor—Trademark Reg. U.S. Pat. Off. DP-1038-8-b

120,000 yds. of sand and caliche were moved in 60 days to transform gravel pit into amphitheater for a drive-in theater at Dallas, Texas. Work-team included 5 Tournapulls, 1 Tournatractor, and 3 crawlers.

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

ARBA

See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

Why

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CARBURIZED

WASHERS

are worth their weight in

GOLD

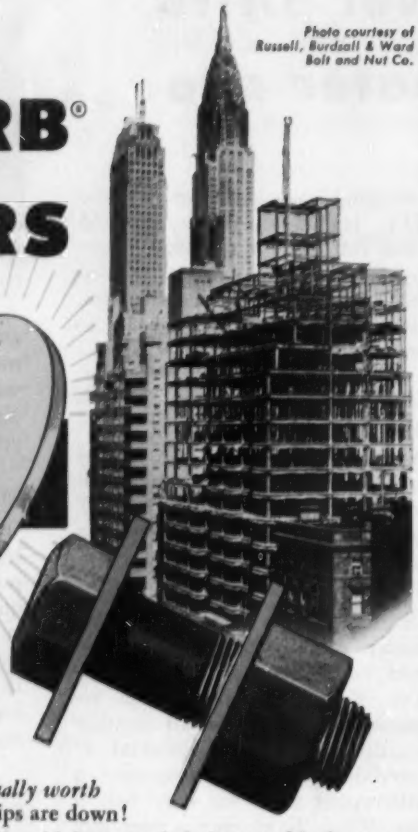

Photo courtesy of Russell, Burdsall & Ward Bolt and Nut Co.

A washer, in relation to a steel structure, is a "tremendous trifle" —insignificant in itself as a unit of the whole, but *actually worth its weight in gold* when the chips are down!

Today it is axiomatic that "no high strength bolt assembly is any better than its washers". Permanently tight, uniformly strong joining of steel members can be secured and maintained *only* if the washers carry their share of the load. On this basis a washer becomes a "tremendous trifle" — *worth its weight in gold!*

The danger of "washer failure" is reduced to a negligible minimum when MIL-CARB Carburized Washers are employed. MIL-CARB carburizing permits securing and holding desired tension. Nuts may be torqued up to specification maximums without danger of "galling" or grinding of the washer by the nut. In addition, MIL-CARB Washers are uniformly flat (of great importance, too).

In order to achieve maximum functional reliability, all MIL-CARB Washers are fabricated from Prime Carburizing Quality Special Soundness Steel, to insure uniform quality control at all times . . . always equal to rigid specifications (ASTM designation: A-325 applying to nuts, bolts and washers). The closely supervised carburizing process retains inner ductility of the metal, yet provides an exceptionally hard "outer skin" that successfully resists galling under the impact wrench.

Don't take chances with heat-treated washers fabricated from steel of possible questionable quality. For your own protection and as a guarantee of the unyielding permanence of your steel structures . . . specify *MIL-CARB Carburized Washers!*

Distributed by Leading Bolt Manufacturers and

U. S. STEEL SUPPLY DIVISION

United States Steel Corporation

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WROUGHT WASHER MANUFACTURING CO.

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2247 S. BAY ST., MILWAUKEE 7, WIS.

PRODUCING AGGREGATES . . . continued

Based on the above definition, the formula for screen efficiency is:

$$E = \frac{10{,}000V}{vT} :$$

V = the tonnage or volume passing through the screen.

T = the tonnage or volume of the whole feed.

v = the percent of undersize in the feed.

(The 10,000 is the constant required to convert the answer to percent: 100 x 100.)

As an example, take a feed of 100 tons of material whose sieve analysis shows that 45% of it is less than ½-in. If the screen passes only 35 tons of this feed material through a ½-in. opening, the screen's efficiency is:

$$E = \frac{10{,}000 \times 35}{45 \times 100} = 77.7\%, \text{ say } 78\%$$

Screen Capacity

There are so many variables affecting the production capacity of screens that at best it is only possible to estimate output. However, relatively close capacity data from field operations, experience, and tests permit calculations not too far from the mark. From this data have been established certain factors for capacity formula:

Real capacity = Basic capacity x A x B x C x D;

Real capacity is determined in tons per square foot.

Basic capacity, in tons per square foot, varies with the type and physical condition of the material.

A is a factor for the number of screening decks above the screen deck under consideration.

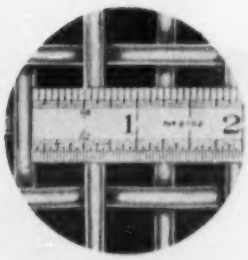
B refers to the amount of aggregate that has a particle size less than half the dimension of the opening through which the particle must pass.

C is a factor based on dry or wet screening operation with water spray directly on the material.

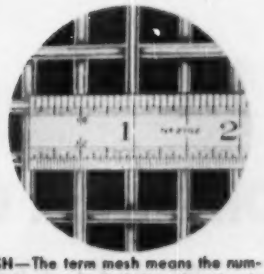
D refers to the amount of material in the feed that has a particle size larger than the opening through which the screened material must pass. It is the percent of oversize in the feed.

Accompanying tables provide data for each of the above factors for the screen openings and conditions indicated. Not all manufacturers publish identical data, for some include more factors than others. On the average, however, the values shown can serve as a guide to most normal applications in the production of aggregates.

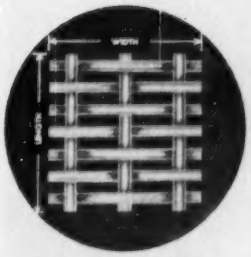
Here Are Definitions Of Terms Used in Describing Wire Screens



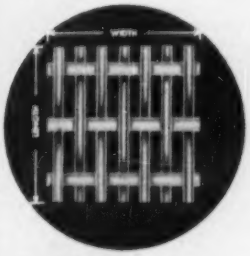
OPENING—This refers to the clear opening or open space between the wires

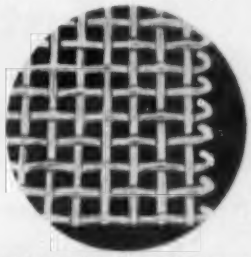


MESH—The term mesh means the number of openings, *including* the wire, in one lineal inch, starting from the center of one wire

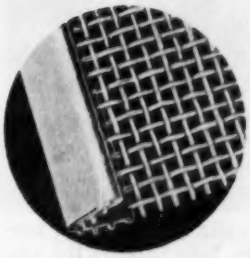


OBLONG (SLOTTED)—This applies to openings or mesh that are longer in one dimension than in the other





SIDES FORMED—The term sides formed refers to the hooks on the sides which are engaged by the side clamp bars



SIDES FORMED AND SHROUDED BANDING—This applies to the lighter sizes of wire in which the hooks are covered with metal strips to prevent the wires pulling out along the edges. The shrouded banding is furnished with No. 12 gauge and lighter wire

TRI-LOCK—This term applies to a type of weaving slotted openings. When the length of the opening is considerably longer than the width, three cross wires are used instead of one

---

Basic Capacity in T.P.H. (Short Ton) per Square Foot of Screen*

Size of Opening	⅛	¼	⅜	½	⅝	¾	⅞	1	1½	2	2½	3	4
Crusher Run	.5	.9	1.2	1.4	1.6	1.7	1.9	2.1	2.7	3.1	3.4	3.7	4.0
Gravel	.8	1.0	1.4	1.7	1.9	2.1	2.4	2.5	3.2	3.7	4.0	4.4	4.8

*Based on 85% screening efficiency; crusher run and gravel based on 100/cu. ft. material.

Factors

A — Correcting for No. of screening decks above		B — Amount of aggregate feed to deck less than ½ opening		C — With water spray directly on screen		D — Estimated percent of oversize fed screen	
Deck	Factor A		Factor B	Screen Opening	Factor C	% Oversize	Factor D
Top	1.00	10%	.5	..	...	10	1.05
Second	.90	20%	.7	..	...	20	1.00
Third	.80	30%	.8	..	...	30	1.00
		40%	1.0	..	...	40	.95
		50%	1.2	3/16	3.50	50	.90
		60%	1.4	5/16	3.00	60	.85
		70%	1.8	⅜	2.50	70	.80
		Over 70%	Use 1.8%	½	1.75	80	.70
				1	1.25	90	.60
						92	.50
						94	.44
						96	.35
						98	.20

EXAMPLE:

How large a screen would be necessary to wet screen 80 T.P.H. of ½" minus gravel through the bottom deck of a two deck screen. There is 40% oversize (½+) on bottom deck and 60% of ¼ minus (½ the size of the ½" opening).

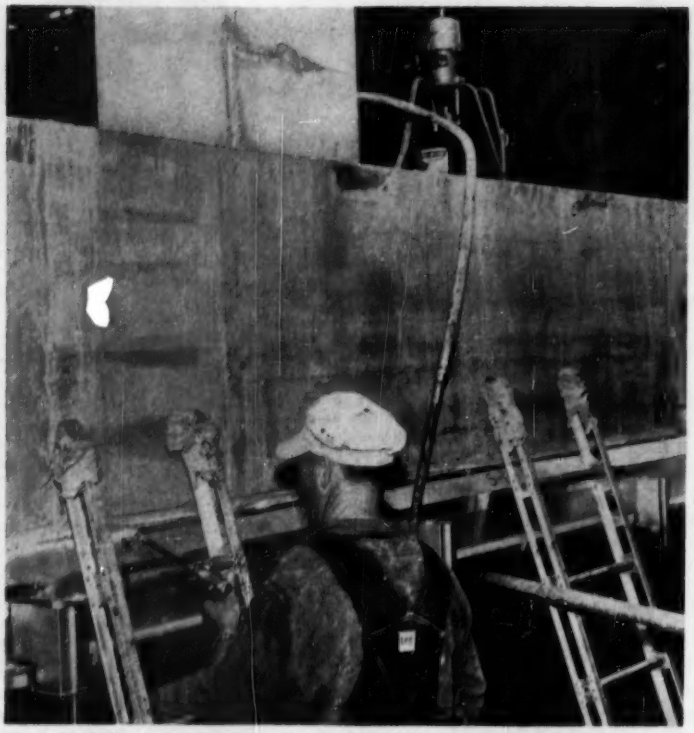
Factor A = .90
Factor B = 1.4
Factor C = 1.75
Factor D = .95

Correction Factor = A×B×C×D
= .9×1.4×1.75×.95
= 2.1

From the table on capacity, 1 square foot of screen ½" opening will screen 1.7 T.P.H. without the correction factor.

With correction factor of 2.1
Capacity per square foot = 1.7×2.1
= 3.5 Ton
Screen Area required = 80/3.5 = 25 Sq. Ft.

One-Man Crew Seals Panels At Fast Clip



DIRECTING RIBBON of compound by spray gun into panel joints keeps caulking material loss at a minimum. Workman uses same scaffolding as erection crews.

A PORTABLE CAULKING RIG makes possible fast, economical caulking and waterproofing of curtain wall panels on the Lutheran Brotherhood Building, Minneapolis, Minn.

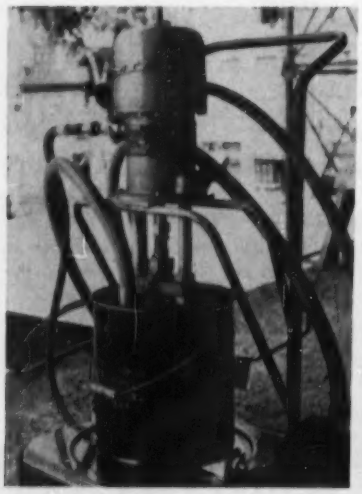
As fast as erector crews fit the porcelain panels into place, one man with the portable rig follows up caulking and waterproofing seams and joints tight. He easily keeps pace with erector crews. The job normally is done by hand and requires more than one man to get any kind of speed.

Using a spray gun equipped with a nozzle extension to pinpoint the flow of material, he directs a narrow, continuous ribbon of caulking compound into the joints. Waste of material is held to a minimum.

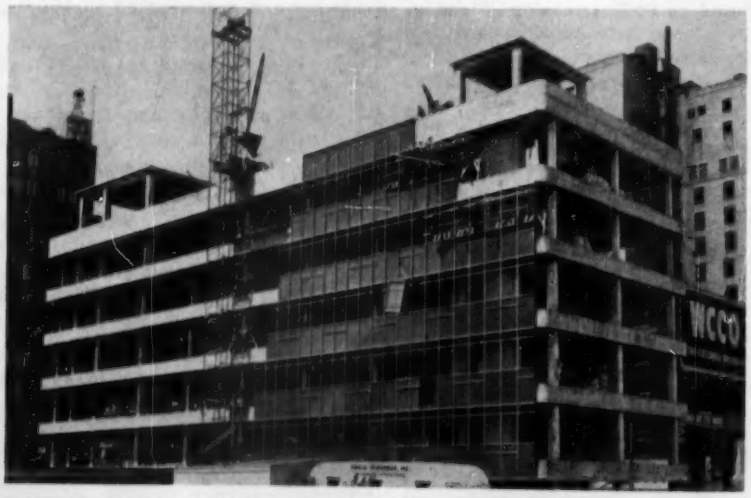
Caulking compound is pumped directly from the original 5-gal containers to the point of application by a Graco Powerflo pump. For added flexibility, air pump and container are mounted on a two-wheel hand-truck that moves easily from spot to spot.

A small, air-cooled engine supplies air pressure at 100 psi to the air pump. For high-pressure, high-volume delivery of material from pump to gun, the contractor uses two sections of Thermoid wire braid hydraulic hose. A 15-ft section of ¾-in. hose handles the viscous material from container to scaffolding. A 6-ft section of ½-in. hose delivers caulking to the spray gun.

General contractor on the job is Kraus-Anderson, Inc.



DISPENSING RIG set on two-wheel hand-truck is easy to move from panel to panel and permits one-man operation.



EXTERIOR CURTAIN WALLS of Lutheran Brotherhood Building in Minneapolis has 768 porcelain and glass panels set over stainless steel frames. Contractor developed portable rig to permit caulking of panels in pace with erection crews at low labor cost.

Macks are popular on the St. Lawrence Seaway... and for good reasons—their bonus capacities, sure-footed traction, and dependable power pay off. (Right) A Mack lineup ready for work on...

The St. Lawrence Seaway... a big job for big trucks...

...a job for a lot of heavy-duty Macks—that's the conclusion of Miron & Freres, Limited, the contractor working on the Cote St. Catherine section of the St. Lawrence Seaway. They are using Mack off-highway dumpers exclusively, over 30 of them, for their big earth-moving job. And their big Macks are paying off for them in real hauling efficiency—plenty of power for big payloads with minimum maintenance costs... even during winter operations.

Like these big dumpers, all of Mack's heavy-duty construction chassis for concrete mixers, tractors, and flat bed trucks can be relied upon for outstanding performance. Rugged construction, dependable power, low maintenance, as well as such features as Mack's Balanced Bogie and exclusive Power Divider—the four-wheel tandem drive that delivers power only to the wheels with traction—make Macks the logical choice for getting jobs done on schedule, and at a profit.

For full details, see your Mack Branch or Distributor. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

MACK
first name for
TRUCKS

Construction Men in the News . . .

Atkinson in the west . . .

Perini in the East . . .

Moles Awards Touch Coast to Coast

GUY F. ATKINSON, (left) board chairman of Guy F. Atkinson Co. of San Francisco, and **LOUIS R. PERINI,** contractor and baseball magnate, will receive the 1957 Moles Award. The Moles, an organization made up of leaders of the heavy construction industry, make the award annually for outstanding achievement in construction.

Perini, president of B. Perini & Sons Inc., Framingham, Mass., is the member-awardee, while Atkinson will receive the non-member award. Presentations will be made at the organization's annual awards dinner in New York City next Feb. 6. They are the 17th pair of men so honored.

Atkinson's company represents three generations of contractors. The organization has been active on engineering and construction projects throughout the world. These include Hansen Dam in Los Angeles County; Harlan Dam, Nebraska; Pine Flat Dam, California; the Ross Powerhouse and Rock Island Dam, and all eight contracts on the $105 million McNary Dam and Powerhouse.

During World War II, the company built the Roosevelt Navy Base at Long Beach, Calif., several large construction projects in Alaska, and now holds $50 million in contracts on the Dalles Dam and Powerhouse. The company also is presently supervising the $65 million Sakuma Dam in Japan and has recently completed the $32 million Ambuklao Dam in the Philippines.

Atkinson is a member of the American Society of Civil Engineers, was national president of the Associated General Contractors of America in 1939, and holds a doctor of science degree from Willamette University.

Perini started in his father's construction business as a water boy. Along with his brothers, he worked part time at various jobs while going to school.

In 1924, his father suddenly died. Perini, only 21 years old, became president of the firm. His brothers, Joseph, Charles, and Alfred took other posts, and they struggled to manage the organization that had suddenly become their responsibility.

Perini's first big job was a $350,000 bridge construction contract near Boston. It was small compared to work he was to do, but at that time the job meant entry in construction's big leagues.

By 1933, B. Perini & Sons, Inc., had completed many large road building projects in the eastern states. Like many contractors in that period after the depression, Perini entered the heavy construction field where public works were the mainstay of the industry.

Soon other big jobs followed. They included the core wall of the Winsor Dam, the Murphy Dam, the Caleb Mills Saville Dam, Birch Hill Dam, Cape Cod Canal Widening, Park River Conduit for the city of Hartford, Conn., Tuscarora Tunnel on the Pennsylvania Turnpike, and the Merriman Division Tunnel for the Board of Water Supply, N.Y.C.

During World War II, Perini branched out into strip mining and deep coal mining, and at one time was operating 18 mines producing five million tons of coal. The company dropped its mining work after the war. Perini also is owner—with his brothers—of the Milwaukee Braves Baseball Club.

There's a difference in parts quality. And there's a whale of a difference in parts *service*, too.

At your Caterpillar Dealer your order is checked against up-to-the-minute parts catalogs and other *strictly current* references. You're always sure the parts delivered are the *right* parts—they fit and function properly. But while your Caterpillar Dealer naturally excels in emergency service, your needs are mostly routine; and his routine service is quick, accurate and complete, too.

When you need a part, why take a chance? Call on your Caterpillar Dealer. Get CAT* original parts—and SERVICE—every time.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

Your Caterpillar Dealer's parts staff is carefully selected, carefully trained under direct factory supervision. Training is continuous and thorough. The service you get is *expert service—Caterpillar service.*

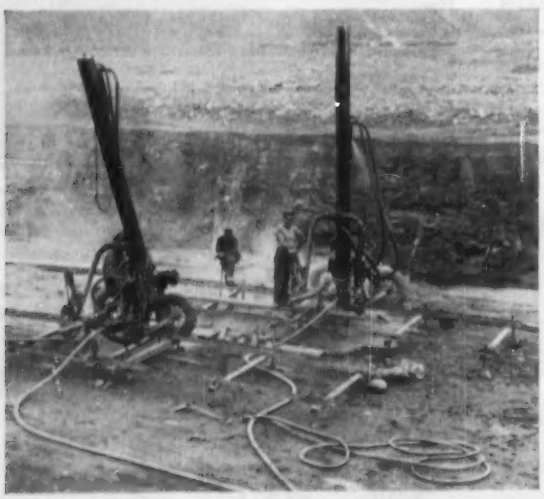
CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Rock work report on the

On the first 32 miles, 69.1% of the heavy-duty rock drills are GARDNER-DENVER

This contractor has 11 "Air Trac" Drills on the Beauharnois canal and lock project. Contract calls for 1.1 million cubic yards of rock removal.



Line drilling with Gardner-Denver Wagon Drills for excavating 7600 lineal feet of seaway channel between Jacques Cartier and Victoria bridges.

Rotary 600 . . . one of the 16 Gardner-Denver Portables on this stretch of the seaway. In use are Rotary 600's, Rotary 900's and piston-type portables.

St. Lawrence Seaway

▲Approximate locations for contracts using a total of 47 Gardner-Denver rock drills.

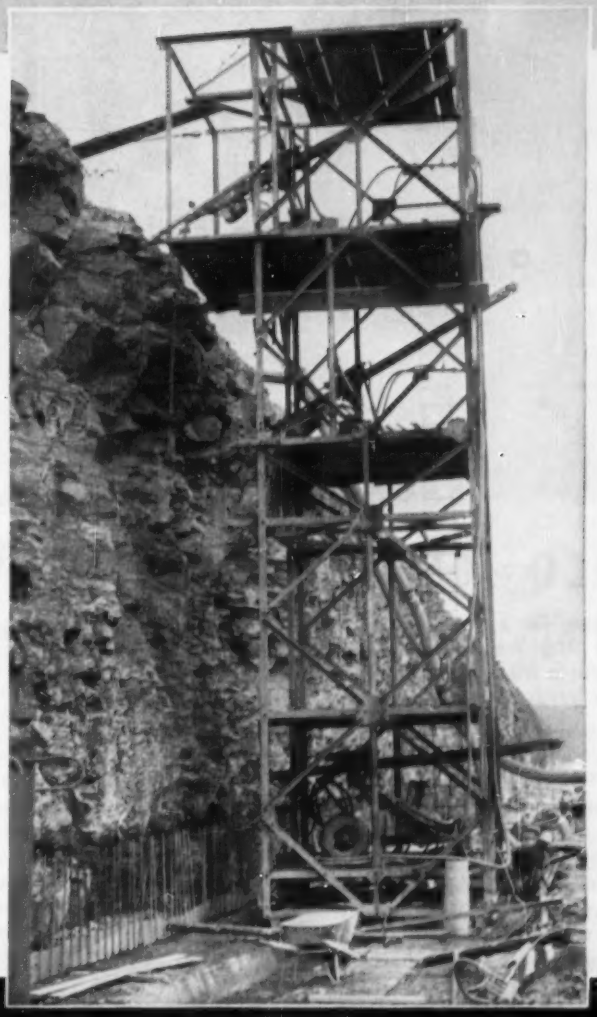
That's on the Lachine and Soulanges sections—where most of the heavy rock excavation is going on.

Here, ten contractors are using a total of 68 heavy-duty rock drills. 47 of these drills—or 69.1%—are Gardner-Denver. At work are:

25 Gardner-Denver "Air Trac"® Drills
18 Gardner-Denver Wagon Drills
4 Gardner-Denver Jumbo Drills

All these drills are equipped with Gardner-Denver steel—mostly with 600 Series ring seal shanks, sectional rods, couplings and bit adapters.

On the same stretch of seaway . . . **16** of the 24 portable air compressors are Gardner-Denver.



40-foot-high scaffold mounts three Gardner-Denver DH99J Drills on 10-foot RMC Feeds. Drilling 3-inch anchor bolt holes, 30 feet deep, for reinforcing rods.

GARDNER-DENVER

THE QUALITY LEADER IN COMPRESSORS, PUMPS, ROCK DRILLS AND AIR TOOLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

EIMCO 105 – A LOADING CYCLE TIME SAVER

Working for a major railway firm in track maintenance operations, an Eimco 105 Tractor-Excavator provides extra-production capacity in loading out a 50-cubic-yard car every eight minutes. The Eimco loads 125 cubic yards more every hour than the machine it replaced.

For this steady job, the 105 is equipped with the high discharge rocker arms and bucket.

The Eimco replaced a 1½ yard shovel that was loading five cars an hour. Before the operator mastered extra-production features of the 105, it was loading six cars an hour. With an experienced operator, it now averages 7½ cars an hour.

Previously, one of two dozers pushing gravel toward the loading edge, came off the 50-foot-high pile to push loaded cars to the switch. The 105 now accomplishes this task and the shovel and one dozer have been released to work elsewhere.

How does the 1½ yard Eimco, with an initial investment that is nearly one-third less, take on extra duty and still increase production?

The answer is in the 105's ability to save time during every loading cycle. With one hand, the operator pushes two, easy-to-reach levers and the Eimco moves in for a load. Powerful crowding actions fills the bucket quickly. He pulls the levers and the 105 reverses to the haulage car while the loaded bucket is elevating in an arc.

When the Eimco is in dumping position, the bucket is in discharge position. There's no lost motion between loading and discharge.

Independent track control permits the 105 to maneuver fast and sharp—another time saver.

And shifting between high and low speeds—forward and reverse—is done under maximum loads at anytime without injury to the transmission. You don't have to stop to shift—or hesitate until the tachometer needle falls below the recommended RPM reading.

The best way to get an idea how the Eimco 105 will increase your production is to watch it perform. You can arrange this today by writing Eimco.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

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Cleveland, Ohio Houston, Tex. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

BEFORE RETREADING a tire, dismount it completely from the rim and examine its casing on a spreader. A tire with a major internal defect cannot be recapped satisfactorily.

Three 'Musts' for Tires

Choose the right tire for the right job.

Set up an inspection schedule.

Know when to recap tires.

FOLLOW these simple recommendations and you will get a good deal more wear from both on and off-the-road tires.

Low-cost tire operation really begins with the proper choice of a good quality tire that meets your job requirements. Tire manufacturers are the first to say that there really is no such thing as an "all-purpose" tire. Various tires are designed to meet certain conditions: one type resists bruises or cuts; another type offers exceptional flotation or traction; still another tire will take great loads. Since no tire combines all these qualities to the same degree, make sure that your tires are matched to your job requirements.

Because they double impact and heat resistance, nylon casings in both on and off-the-road tires have been a blessing to the construction industry. Not only does the tire last longer, but the improved fabrics now available in modern tires make recapping both safe and practical.

The Tire Retreading Institute points out that a recap job on a worn tire is only as good as the tire casing. While the new casings are much stronger than previously, it is still important to know when to send a tire to be retreaded. The ideal time, according to the TRI, is just before the thread design completely disappears. If the thread is worn down to the casing, it makes a difficult job; and if there is a major defect in the casing —on the sidewall or the thread— you might just as well junk the tire immediately.

Before sending a tire out to be recapped, dismount it completely from the rim and place it on a spreader. Inspect the inside of the cord as well as the tire's exterior. If the cord remains in good shape, you can recap the tire several times and more than double its life expectancy.

According to the TRI, the only way to assure that the cord of a tire is not being damaged unnecessarily is to maintain records that show mileage traveled or hours of service, inflation checks, tire rotation dates, and the dates of visual inspections. While most contractors make some effort to keep such records, TRI believes that a lot of good rubber is going to waste because of inefficient supervision of record systems. If your system is not as good as it could be, the TRI or any tire manufacturer will help you establish a simple inspection technique that will meet your present needs.

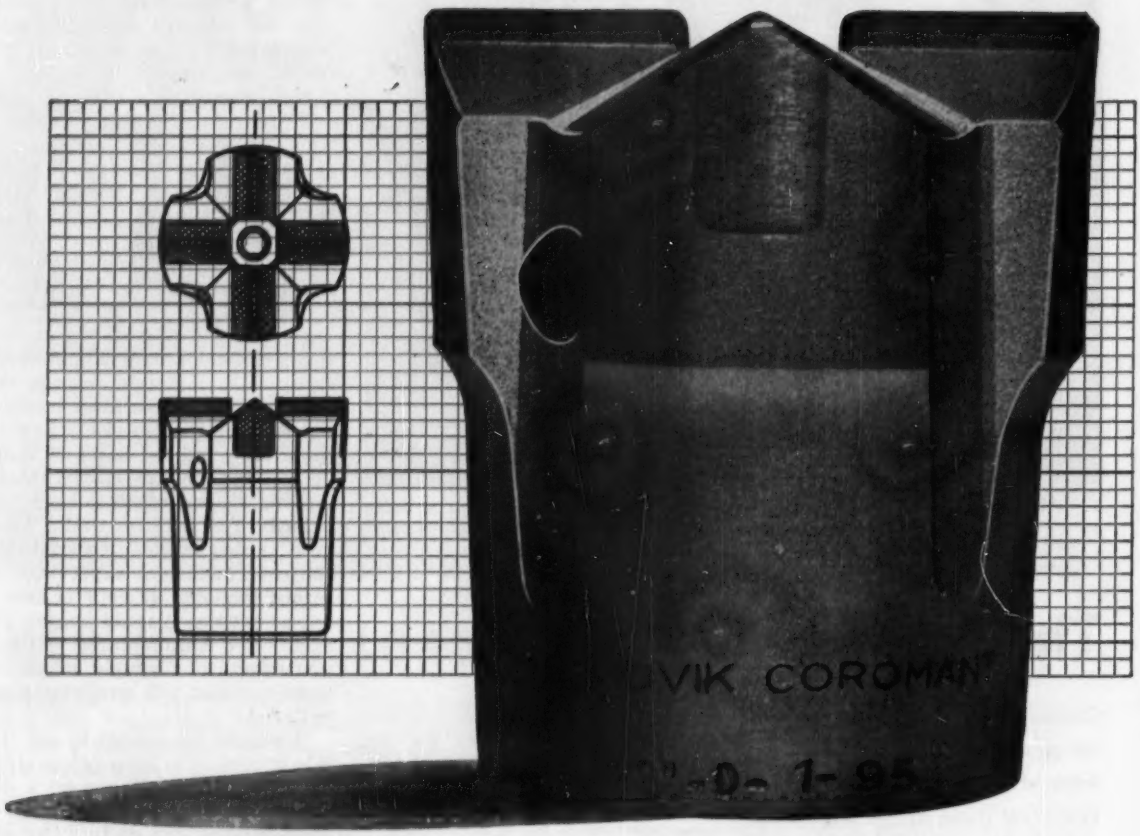
It sounds too simple to say that it is important to keep a close check on air pressure. However, a discussion of what under-inflation or over-inflation can do to a tire will bring the point home hard.

According to the Goodyear Rubber & Tire Co., over-inflation is one

Tire Size	Ply Rating	TIRE LOADS AT VARIOUS INFLATION PRESSURES								
		25	30	35	40	45	50	55	60	65
14.00-20	16	5340	5620	6140	6630	7100	7550	8000	8400	
16.00-20	16	6670	7430	8120	8780	9410				
18.00-24/25	16	9580	10670	11670	12620					
18.00-24/25	20	9580	10670	11670	12620	13520	14380			
21.00-24/25	20	12250	13640	14910	16120					
21.00-24/25	24	12250	13640	14910	16120	17280	18370			
21.00-29	20	13500	14820	16200	17510					
24.00-25	18	15130	16860	18420						
24.00-25	24	15130	16860	18420	19930	21340				
24.00-29	24	16520	18200	19890	21500	23020				
24.00-29	36	16520	18200	19890	21500	23020	24500	25930	27350	28690

TIRE & RIM ASSN. recommends these load limits for off-the-road tires used at travel speeds up to 30 mph. Underscored figures show the maximum load for each tire size.

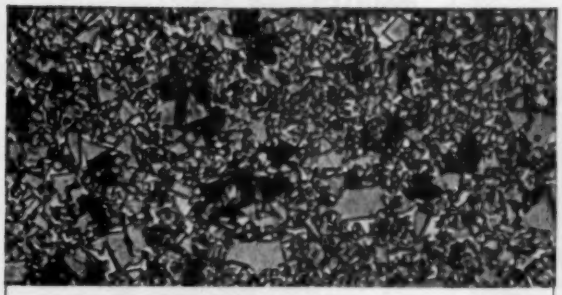
THIS ROCK BIT IS PRECISION-MADE FOR A HIGHER PERFORMANCE



Nothing tougher and more wear-resistant than the insert of a Sandvik Coromant 776 bit

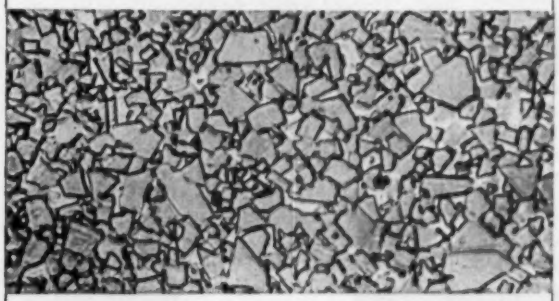
Rock bits that go on *and on* must have highest-grade tungsten-carbide inserts. Nothing but tungsten carbide in its purest state is good enough, will last as long. That's why the carbide that goes into a Sandvik Coromant 776 bit is meticulously controlled.

Sandvik, the world's largest manufacturers of brazed-in tungsten-carbide inserts for rock drilling, control every phase of production. Coromant carbide is scrutinised for impurities from the very first stages of processing the tungsten ore, right through to the final inserts. Add to that Sandvik's special process of securing the insert to the body, employing an exceptionally strong bonding metal, and you know why a Coromant 776 bit lasts longer. In 1955, one billion feet were drilled with these inserts, all fitted to Sandvik Coromant bits or integral steels. *Nothing is more conclusive of the quality of Coromant bits than this figure.*



LOW QUALITY TUNGSTEN CARBIDE

These are unretouched, 1200-times enlarged microphotos. Above, carbide full of impurities. Those black marks are contaminations which are present when production and quality control are deficient. Contamination of this kind weakens the carbide and reduces its working life.



SANDVIK COROMANT TUNGSTEN CARBIDE

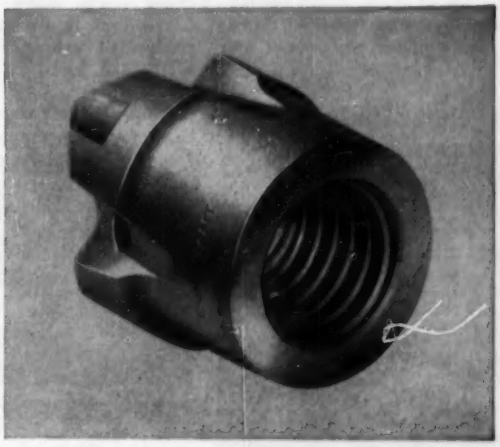
This is Coromant carbide. Notice the uniformity of size and the even distribution of grain. Coromant inserts are free of dangerous porosity and impurities—the reason they go further, have greater strength.

Nothing stands the strain like the Swedish body of a Sandvik Coromant bit

When you put the strongest possible tungsten carbide into a rock bit, the body has to be the strongest available to take the extra strain. That's why Coromant bodies are made of high-quality Swedish alloy steel. But that's not all. Inserts and clearance are cylindrically-ground and the insert ends precision-tooled to exactly the same height. This means *smoother* drilling and *smoother* holes, because the load is equally distributed on all four inserts. *Precision engineering such as this give Coromant bits a longer life!*

Nothing fits like the precision-milled threads of a Sandvik Coromant bit

In order to get a smooth profile of the highest accuracy, Coromant threads are precision-milled in a special thread-milling machine and not made with a tap. Precision-milling too protects the skirt from common fatigue failures.



SANDVIK COROMANT 776 BITS

and Sandvik Coromant integral steels are available in standard sizes through Atlas Copco, who, in their own field, are the world's largest manufacturers of rock drills. Contact any of these offices *today* for further information and a demonstration.

U.S., Atlas Copco Pacific, Inc., 930 Brittan Avenue, San Carlos, California. Atlas Copco Eastern Inc., P.O. Box 2568, Paterson 25, N.J.
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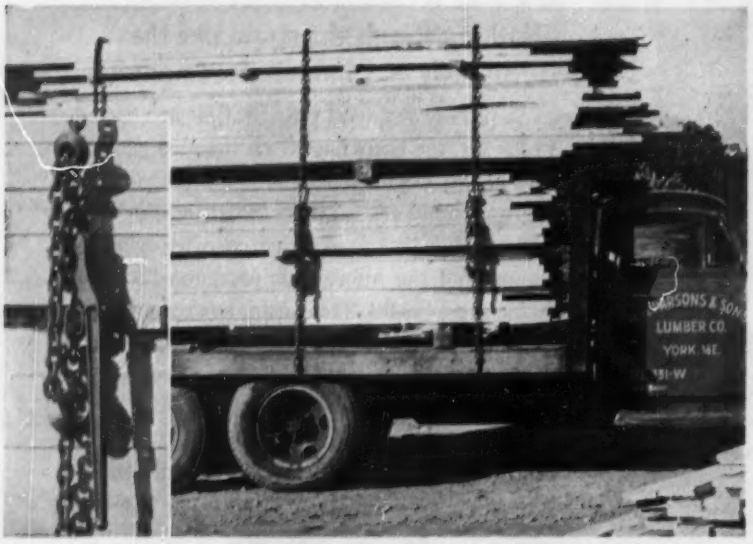
Atlas Copco

Manufacturers of Stationary and Portable Compressors, Rock-Drilling Equipment, Loaders, Pneumatic Tools and Paint-Spraying Equipment



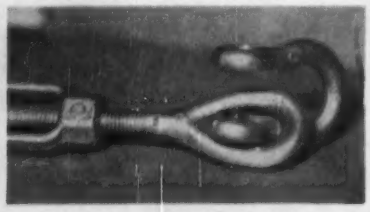
LOADS SAFELY BOUND

Safety conscious contractors tie down their truck loads of construction material with Laughlin Load Binders! There's no chance for injury or loss because the smooth lever action takes up 4½-inches of chain—holds lumber, piles, pipe, sheet material positively—safely! This tough, drop forged and heat treated binder is the most versatile available—and it's made for the strongest chain! One Laughlin binder will handle four chain sizes! Merely switch Clevis Grab Hooks to fit the chain you're using! Keep Laughlin Clevis Grab Hooks on hand to fit your chains—then there'll be no delays!

100% HOLDING POWER

When genuine Crosby* Clips secure wire rope rigging and tackle, men and materials are 100% safe! Positive gripping power gives confidence to workers, and confidence means top working efficiency. High strength steel is formed into the world-famous "Red U-Bolt"*. High wings on the drop forged base hold the rope securely in place. Look for the "Red U-Bolt"! You'll see it used on ropes of all sizes, because only Crosby offers a complete range of sizes to fit ⅛" to 3" diameter ropes!

*REGISTERED TRADEMARK



AN EYE FOR SAFETY!

. . . that's the eye design that was originated by Laughlin engineers. The ear of a shackle only one size smaller slips through the pear shaped eye—a design that conforms more closely to the line of pull—makes Laughlin Turnbuckles stronger and safer! Hex ends on the hefty body make take-up fast and easy. Weldless, hot galvanized turnbuckles, forged from special steel, are available from Crosby-Laughlin Distributors in a variety of end fittings and in sizes from ¼" x 4" to 2¾" x 24"!

Stocked and sold by leading distributors everywhere

CROSBY-LAUGHLIN *Division*

American Hoist and Derrick Company

FORT WAYNE 1, INDIANA

MAINTENANCE SHOP . . .

continued from page 123

of the main causes of tire failure. You cannot compensate for overloading by over-inflating your tires, nor can you add strength to the tire this way. The truth is that overloading actually weakens the cord body by reducing its ability to take shock. It also leads to bruises and cuts, excessive wear in the center of the thread, stretching, and excessive strain on the bead and rim.

Under-inflation results in overflexing of tire sidewalls. This leads to a build up of excessive heat that causes ply and thread separation. It also wears the thread on the shoulders, increases its tendency to bruise or cut, and wears the thread irregularly.

To maintain correct air pressures, Goodyear recommends that tires be checked frequently to see that air pressures conform to the load and inflation recommendations of the Tire & Rim Institute (See table for off-the-road equipment). Air pressure should correspond to the actual load the tire carries. If tires are continually carrying less than the recommended maximum load, they will last longer if air pressure is adjusted to meet the requirements of the load. However, you cannot compensate for overloading by increasing pressure above recommended limits. This only shortens tire life.

Some pressure build-up is normal. Tire manufacturers recognize that temperatures will increase when the tire is in service and they allow for that build-up when they establish limitations on a tire. Never bleed air pressure build-up under operating conditions. Also be sure tires have cooled down when you make a pressure check.

Goodyear research has established that the operator who constantly overloads his tires to gain extreme revenue from the extra payload is actually losing money. The additional profits obtained by the extra payload are more than consumed with an increase in tire wear—as well as an increase in wear on other parts of the vehicle. Remember that the type of material that the vehicle is handling indicates the true load on the tires. A heaped load of packed earth and a heaped load of marl clay, for instance, may have the same volume but the difference in the load may amount to more than 1,000 lb.

See the LATEST in BIG LOADERS at the Road Show

(SOUTH HALL — ALLIS-CHALMERS AREA)

new TRACTOMOTIVE TL-20 TRACTOLOADER

20,000 lb
2-cu yd capacity • 95.5 hp

HAS—

FULL POWER-SHIFT TRANSMISSION that enables you to go from any forward to any reverse speed instantly. You quick-shift "on the fly" — no stop-and-go shifting.

HAS—

HYDRAULIC TORQUE CONVERTER DRIVE that multiplies torque 350 percent . . . provides the smoothest loading action you've ever seen in a wheel loader. No butting or ramming, no engine stalls.

HAS—

- High Traction Differential with Pin-Connected, PLANETARY AXLES
- Tip-Back Bucket
- Rear-Wheel Power Steering
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- Full-Flow Oil Filter
- Screen and Magnetic Filters in Hydraulic System
- Lift and Dump Cylinders located well above ground and out of the way.
- One-Piece Welded Frame

Only Tractomotive brings you all these operating and service advantages. You PAY LESS . . . You GET MORE.

TRACTO — a sure sign of modern design

TRACTOMOTIVE EQUIPMENT
IS SOLD AND SERVICED BY YOUR ALLIS-CHALMERS CONSTRUCTION MACHINERY DEALER.

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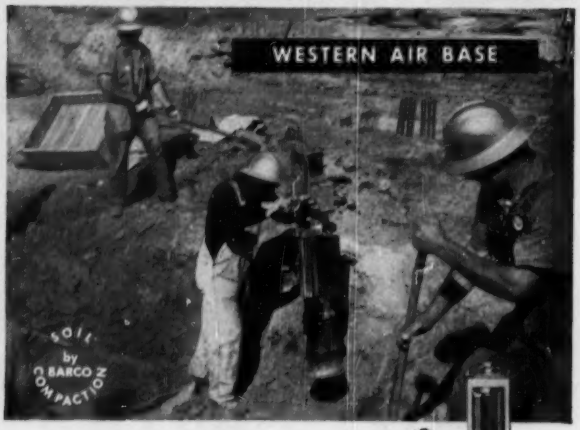
GASOLINE **BARCO** RAMMER



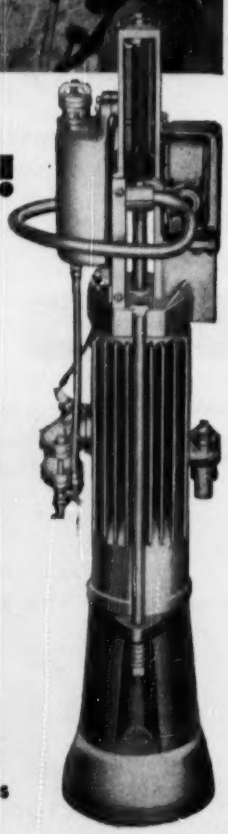
The Key to Better Construction!

NO RECENT TREND in construction has had a more phenomenal growth than the specification of HIGH DEGREE SOIL COMPACTION for all kinds of projects—Atomic Energy, Hydroelectric Power and Flood Control Dams, Highways, Toll Roads and Freeways, Airports, Bridges, Buildings, and Housing Developments! The increase in the use of Barco Rammers on these jobs has been equally great.

Easily meets rigid specifications—
In test after test, Barco Rammers have demonstrated their ability to deliver 95% to 97.5% compaction (modified Proctor Method)—EASILY! EFFICIENTLY! ECONOMICALLY! The Barco Rammer is especially useful for compacting fill in restricted areas—close to walls, culverts, abutments, around footings, and in trenches. ONLY the Barco Rammer can produce specified high degree compaction on lifts up to 20 inches.

Gets jobs finished on time—
One of the biggest advantages offered by Barco Rammers is ability to handle work in minimum time. On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On trench backfill, using lifts up to 24", the rate for 18" trench is 360 to 600 feet per hour.

Barco performance pays dividends! We will be glad to arrange a demonstration for you—see our nearest dealer or write.



BARCO MANUFACTURING CO. BARCO **512N Hough Street, Barrington, Illinois**

Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

Distributors

LeRoi Div., Westinghouse Air Brake Co.: A New York City area distributorship, the LeRoi Equipment Sales Co., Inc., has been established to handle LeRoi's line of portable and stationary air compressors, air tools, internal combustion engines, and engine generator sets. The office is located at Elmhurst, Long Island. Hugh H. Goodwin is vice president and general manager of the new distributorship which will be operated as a subsidiary of Westinghouse. The company-owned distributorship "was necessary in the unique metropolitan area," according to an announcement, but the establishment of LeRoi Equipment Sales Co "in no way indicates a company policy toward direct distributorships."

Cleaver-Brooks Co.: The C. H. Grant Co., Oakland, Calif., has been appointed manufacturers' representative for the sale of Cleaver-Brooks asphalt heating and pile driving equipment. The distributor's territory covers 45 counties in the San Francisco area.

On the Sales Front

L. B. Foster Co.: Angus A. Coughlin has been added to the New York sales staff, according to a recent announcement by Charles G. Hugus, vice president. L. B. Foster is a national distributor of pipe, steel sheet piling, and rail and track accessories. Other offices are in Pittsburgh, Chicago, Los Angeles, Houston, and Atlanta.

Huber-Warco Co.: C. R. Dabney has been named district sales representative for five southern and southwestern states. Formerly with Dun and Bradstreet, Dabney will work with Huber-Warco distributors in Texas, Oklahoma, Arkansas, Louisiana, and New Mexico on sales and service of motor graders, tandem rollers, three-wheel roll-

Less down time... longer life when protective maintenance is done ON TIME!

HOBBS Engine Hour METERS

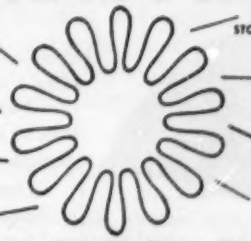
Modern engineers consider maintenance of powered equipment in terms of HOURS instead of miles. ON-TIME lubrication, filter replacement, oil change, overhaul, etc., means better performance and longer equipment life.

The Hobbs Meter, a true electric timing instrument, records actual running time in HOURS and MINUTES — not a revolution counter! Two models — direct-reading (upper illustration) and pointer type. Approved and recommended by leading manufacturers of construction equipment. Ruggedly built . . . easy to install in the field. See your factory branch, representative or distributor . . . or WRITE:

John W. Hobbs Corporation
2070 YALE BLVD. - SPRINGFIELD, ILLINOIS
A Division of Stewart-Warner Corporation

When You Need A Filter—Get The Advantages of Marvels SYNCLINAL Design
It's BALANCED for Top Performance

Sump Type (Cutaway)



Line Type (Cutaway)

For All Hydraulic and Other Low Pressure Liquid Systems

In the selection of a filter to obtain maximum efficiency and quality, the most important point to consider is a specific type filter that will offer greatest ACTIVE filtering area with ample storage capacity for filtered out particles, rather than total filtering area alone. Over 700 Original Equipment Manufacturers install Marvel Synclinal Filters as Standard Equipment because they are designed to give this all-important balance in filtration of liquids in all hydraulic and other low pressure circulating systems. Flow of liquids is maintained at a constant, steady rate of speed produced by the pump which brings about the desired effect of a gentle evenly distributed accumulation of filtered out particles against the entire filtering surface with less restriction of flow. Result—longer periods of productive operation at minimum maintenance down-time.

EASY MAINTENANCE
Both sump and line types may be easily disassembled, cleaned and reassembled by any workman in a matter of minutes. Line type operates in any position and may be serviced without disturbing pipe connections.

A SIZE FOR EVERY NEED
Available for sump or line installation in capacities from 5 to 100 G.P.M. Choice of monel mesh sizes range from coarse 30 to fine 200.

FILTERS FOR FIRE-RESISTANT HYDRAULIC FLUIDS
Marvel's most recent development is a filter for the efficient filtration of all types of fire-resistant hydraulic fluids.

WATER FILTERS
Both sump and line type filters have been adapted for use in all water filtering applications. No changes have been made in the basic, balanced synclinal design.

IMMEDIATE DELIVERY! As in the past, Marvel continues to offer immediate Delivery.

MARVEL ENGINEERING COMPANY
7227 N. Hamlin Ave., Chicago 45, Ill., Phone: JUniper 8-6023

Catalogs containing complete data available on request

Catalog No. 197 for Hydraulic Oils, Coolants, Lubricants
Catalog No. 301 for Water
Catalog No. 200 for Fire-resistant hydraulic fluids (Aqueous Base)
Catalog No. 400 for Fire-resistant hydraulic fluids (Synthetic)

CME-12

Name .....
Address .....
City ..... State .....

Drivers last longer...

when heavy-duty trucks use J-M Brake Blocks

Experienced operators know that when their vehicles are equipped with Johns-Manville Brake Blocks they can handle crushing loads without personal danger.

That's because these rugged, durable J-M Brake Blocks are engineered for the job . . . and designed for dependable performance plus maximum service life on trucks, shovels and heavy machinery.

They are "standard parts" on many famous makes of heavy-duty units. For fast, easy replacement, they are now available in Johns-Manville Assembled Sets that put new safety into your equipment.

See your Johns-Manville Distributor for data on J-M Brake Linings and Clutch Facings for industrial equipment, or write Johns-Manville, Box 14, New York 16, N. Y.

Johns-Manville Industrial Friction Sets are available in a wide range of molded or woven, rigid or flexible asbestos materials.

JM PRODUCTS

Johns-Manville

INDUSTRIAL FRICTION MATERIALS

SALES AND SERVICE . . .
continued

ers, and the Huber-Warco Maintainer. His headquarters are in Dallas.

DuPont: Fred R. Wilson, director of manufacturing of DuPont's explosives department, has been named director of sales of that department. William D. Garwood, assistant director of sales, has been promoted to director of manufacturing. Richard D. Hedreen, manager of the technical service section, has been named assistant director of sales.

White Motor Co.: L. B. Philippi has been appointed to the newly created position of off-highway field representative for the Autocar Div. Philippi was formerly eastern regional sales manager for the Dart Truck Co.

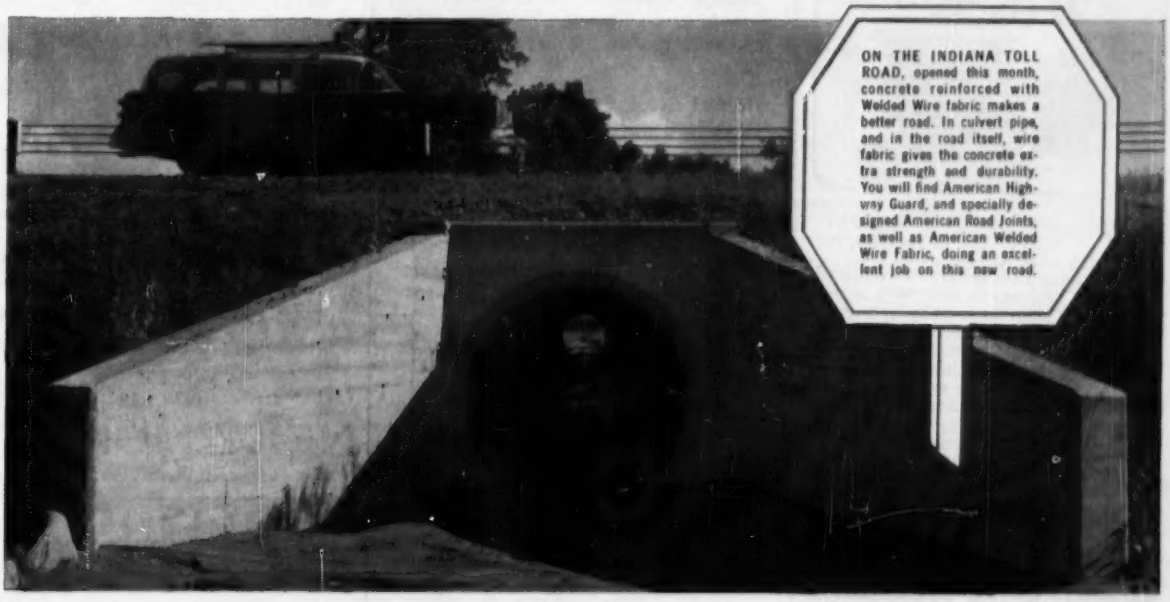
Rankin Mfg. Co.: Sid T. Jordan is southwest district manager for Rankin, makers of Ranite hard-surfacing welding materials. His territory includes most of California, all of New Mexico, Arizona, Colorado, the southern portion of Utah, and El Paso, Texas. He takes over the territory formerly covered by Ted Braucht, who resigned to form his own welding supply shop as a Rankin distributor.

In the Main Office

Joy Mfg. Co.: Changes in the company's organizational structure has meant the establishment of three new general management positions at the vice presidential level. James A. Drain has been named to the newly created post of vice president and general manager of the firm's mining and construction division. Hugo C. Nyquist holds a similar position in the coal machinery division and Louis G. Helmick heads the industrial division.

Caterpillar Tractor Co.: Two new domestic divisions, manufacturing and parts and service, have been formed by Caterpillar. President H. S. Eberhard said the changes "were designed to bring together groups of people having common interests." They were necessary, he said, because of the continuing expansion of the company's activities. The manufacturing division will include the company's eight U. S. manufacturing plants and several general office departments. Vice president C. A. Wood-

Highly Stressed Concrete Lasts Longer
when reinforced with
American Welded Wire Fabric


ON THE INDIANA TOLL ROAD, opened this month, concrete reinforced with Welded Wire fabric makes a better road. In culvert pipe, and in the road itself, wire fabric gives the concrete extra strength and durability. You will find American Highway Guard, and specially designed American Road Joints, as well as American Welded Wire Fabric, doing an excellent job on this new road.

Concrete roads, floor slabs, pipe, walls, sidewalks—all are improved with Welded Wire Fabric reinforcement. They have greater resistance to cracking, last longer, and stay smoother. And now, for concrete that must withstand unusually high stresses, American Welded Wire Fabric comes in larger sizes than formerly. It's now available in diameters up to and including ½", at 2", 3", 4", and 6" on center. It meets ASTM Specification A 185 56T.

The high quality of American Welded Wire Fabric is rigidly controlled from iron mine to you. Made from tough, cold-drawn steel . . . then electrically welded together into a strong network of durable reinforcement, it cuts maintenance cost because it increases service life of concrete. It cuts *installation* costs because it is easily handled and placed. Send the coupon for helpful literature on this and other construction materials manufactured by American Steel & Wire.

AMERICAN STEEL & WIRE
DIVISION
UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

IT PAYS TO ASK
"is it Reinforced"
USS American Welded Wire Fabric
UNITED STATES STEEL

FREE TECHNICAL DATA

American Steel & Wire
Dept. 56-C, Rockefeller Bldg.
Cleveland 13, Ohio

Please send complete information on the following products:

- ☐ American Welded Wire Fabric for Portland Cement Concrete
- ☐ American Welded Wire Fabric for Asphaltic Concrete
- ☐ American Welded Wire Fabric for Airport Runways
- ☐ American Wire and Strand for Prestressed Concrete
- ☐ American Road Joints
- ☐ Multisafty Highway Cable Guard
- ☐ American Beam-type Highway Guard
- ☐ Have your representative call

Name .....
Firm .....
Address .....
City ..... State .....

"THIS LUBRICANT CUT BEARING REPLACEMENTS OVER 40%"

says—HANOVER BUILDING SUPPLY CO. of Hanover, Pa.

"Before using LUBRIPLATE, we replaced the wheel bearings in over 50% of our trucks each year. Since using it, bearing replacements have dropped to less than 10%. We have also been able to increase periods between chassis lubrications from 500 to 2000 miles. We are very happy over our change to LUBRIPLATE, and heartily recommend it to fleet operators interested in saving money."
HANOVER BUILDING SUPPLY CO.
C. O. Albright, Pres.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

LUBRIPLATE LUBRICATION

MAKES CARS AND TRUCKS RUN BETTER AND LAST LONGER

LUBRIPLATE H.D.S. MOTOR OIL . . . THE OIL THAT NEEDS NO ADDITIVES

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

SALES AND SERVICE . . . continued

ley, a veteran of 30 yr with Caterpillar, was named to head this division. Vice president E. W. Jackson will head the newly formed parts and service division. At the same time, Albert N. Whitlock was named manager of the Aurora plant and George Wellner was elected treasurer to succeed V. V. Grant.

Heltzel Steel Form and Iron Co.: R. O. Boden, as the newly appointed general manager of the parent company, will be the principal officer of the Flexible Road Joint Machinery Co. and the Ohio Structural Steel Co. as well as Heltzel. Only 40 yr old, Boden succeeds Carl J. Heltzel, president, who relinquished the general manager position to devote more of his time to company policy.

Special Mention

General Road Machines, Inc.: Chain Belt Co. announces the acquisition of General Road Machines, Inc., manufacturers of steel forms for concrete, finishing machines, and other concrete road building equipment. The company will be operated as a wholly owned subsidiary. Donald T. Heltzel, president of General, will continue as general manager, and J. J. Marcello, General's vice president, will be sales manager. General operates manufacturing plants at Niles and Newton Falls, Ohio.

Associations

CIMA: Kenneth Lindsay, president of the Construction Industry Manufacturers Assn., announced recently that for the first time in history the annual membership meeting of CIMA will take place during a Road Show. The meeting is scheduled for Jan. 31 at the Conrad Hilton Hotel, Chicago. Seven new directors of the association will be elected at the meeting.

Asphalt Institute: Charles A. McKeogh, a well known Texas paving engineer, has been named to succeed William H. Rhodes, retiring district engineer for the Asphalt Institute at New Orleans. At the same time, the Institute announced the appointment of Albert L. Love, Jr., to the post of district engineer for New Mexico. Opening of the new Southwest division office will bring the number of such regional engineering centers to 24.

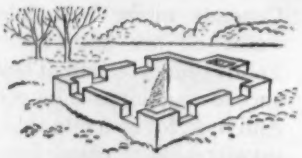
WATCH

For Announcement of

196E56-d

NEXT MONTH

BUCYRUS ERIE



EFCO FORMS
for house foundations

EFCO Steel Forms for concrete construction are adaptable to wide use by their owners, including construction of house foundations. Other advantages:

- **Lifetime steel faces should never need to be replaced.**
- **Easy to handle and assemble.**
- **Saves time, material, money.**
- **Low original cost.**

Other forms from Economy are available on a rental basis. Write nearest office for catalog.

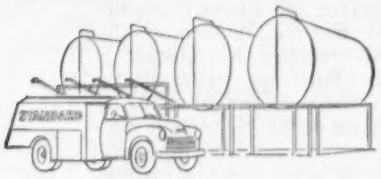
Economy Forms Corp.
DES MOINES, IOWA

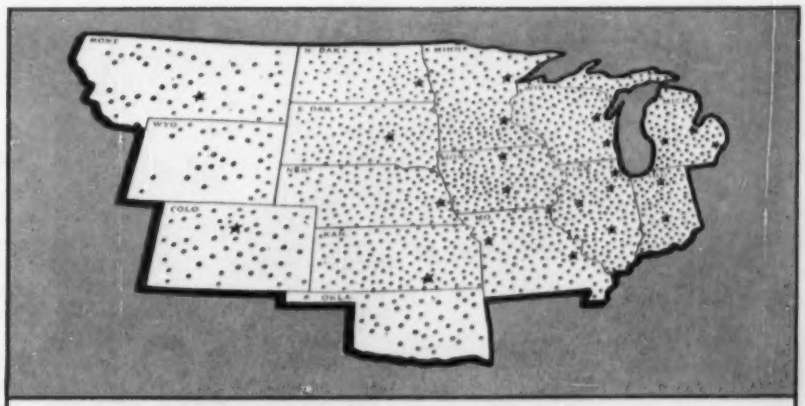
Offices in St. Louis, Mo.; Kansas City, Mo.; Lincoln, Nebr.; Minneapolis, Minn.; Ft. Wayne, Ind.; Milwaukee, Wis.; Chicago, Ill.; Cincinnati, Ohio; Cleveland, Ohio; Metuchen, N. J.; Rochester, N. Y.; Springfield, Mass.; Washington, D. C.; Decatur, Ga.; Charlotte, N. C.; Dallas, Texas; Tulsa, Okla.; Houston, Texas; Los Angeles, Cal.; Oakland, Cal.; Denver, Colo.

Cold facts about buying fuels, motor oils and greases

Why Standard Oil can serve you better

Got a construction job in the Midwest or Rocky Mountain states? Bidding on one? Already working a job? Then read how you can get better service and better fuels, lubricating oils and greases.





Standard Oil serves these Midwest and Rocky Mountain states

Colorado	Iowa	Minnesota	Nebraska	S. Dakota
Illinois	Kansas	Missouri	N. Dakota	Wisconsin
Indiana	Michigan	Montana	Oklahoma	Wyoming

How you get service on the job

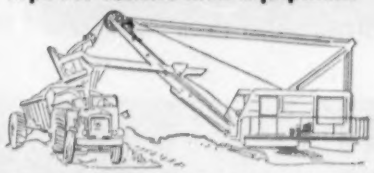
In the 15 Midwest and Rocky Mountain states there are more than 3,900 Standard Oil bulk plants. With this many plants none can be more than a few miles from your job no matter where it is. Experienced men work out of these bulk plants to see that you get on-the-spot service. They see that you are supplied day and night. If you work two shifts or even three, they may too.

In addition, there are 23 Standard Oil division offices in the 15 states. In each office there is a chief automotive engineer and a staff automotive lubrication specialist. All of these men are qualified to give technical service. Most of the men have engineering degrees. They have received extensive training in Standard Oil's own Automotive Sales Engineering School. *All of these men* are Standard Oil *employees.*

The kind of service you get from STANDARD

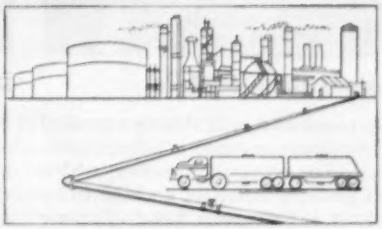
Automotive lubrication specialists from Standard division offices will survey your equipment and recommend the fuels, motor oils, greases to use. They will help you set up a preventive maintenance program and suggest lubrication schedules. They will back this up with service from the Standard Oil bulk station so that your equipment is *never* idle for lack of petroleum products. Through these specialists you have a direct line to Standard Oil headquarters and laboratory for additional help.

Why STANDARD OIL products are tops for construction equipment



Standard Oil lubricants, fuels and greases are approved by equipment manufacturers. But there's more to it than just that. Most big equipment manufacturers' plants are right here in the Standard Oil territory. Standard works closely with these manufacturers, knows what's needed of the fuels, motor oils and greases used in construction equipment. Standard Oil fuels, lubricants and greases are used by many manufacturers in initial fills and lubrication. All products equal or exceed specifications of the manufacturer. They will stand up to any job you give them with plenty to spare.

Refinery to you, it's all STANDARD



All Standard Oil fuels, lubricants and greases are made by Standard and delivered to you by Standard Oil employees, with Standard's own distribution system. Everywhere you go in the Midwest and Rocky Mountain states there is a *Standard Oil* owned and operated bulk plant within a few miles. You deal with one company. Every Standard Oil supply point is equally and uniformly well run.

How to get in touch

Because Standard Oil lubrication specialists so thoroughly cover their territory, you can depend upon meeting your man at any important contract letting—if you haven't already met him. If you miss him, look in the telephone directory of any town—no matter how small—nearest your job. You'll find the Standard Oil bulk plant listed under the Standard Oil name. If you still miss, sit tight, the Standard Oil man will be around to see you *before* you need him and he will be ready to serve you starting right then. If you would like more information right now, write or call Standard Oil Company, 910 S. Michigan Avenue, Chicago 80, Illinois.

STANDARD

STANDARD OIL COMPANY
(Indiana)

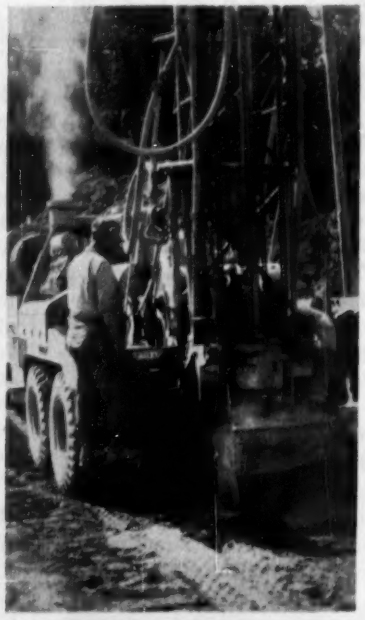
Construction Equipment News . . .

Lima Buys Roadpacker

Baldwin-Lima-Hamilton has just gone into production of an improved version of the Roadpacker, a compaction unit formerly manufactured by the Roadequip Co. The self-propelled Roadpacker is equipped with six hydraulically driven shoes, each weighing 420 lb. Advantages of this rig include flexibility, maneuverability (top travel speed is 30 mph) and low maintenance because moving parts are sealed. The working width of the six shoes cover an area of 13 ft 1 in. For narrow working areas the outside shoes can be folded up under the frame in a few minutes.—**Lima Works, Baldwin-Lima-Hamilton Corp., Lima, Ohio.**

Differential-Acting Hammer is Versatile, Mobile

Vulcan's new portable differential-acting pile hammer is shown mounted on a LeRoi Tract-Air unit. On this job, the hammer demolished an average of 2,000 lineal ft of 9-in. curbing a day. The versatile hammer, which weighs only 786 lb including the impact plate, is compact enough to be carried in the back of a jeep. Only 4 ft long, it delivers a 386-ft-lb blow and works on the same principle as the Super-Vulcan hammer. The hammer operates off compressed air or steam. On the curb breaking operation, above, it is powered by a 105-cfm compressor.—**Vulcan Iron Works, Inc., 327 N. Bell Ave., Chicago, Ill.**

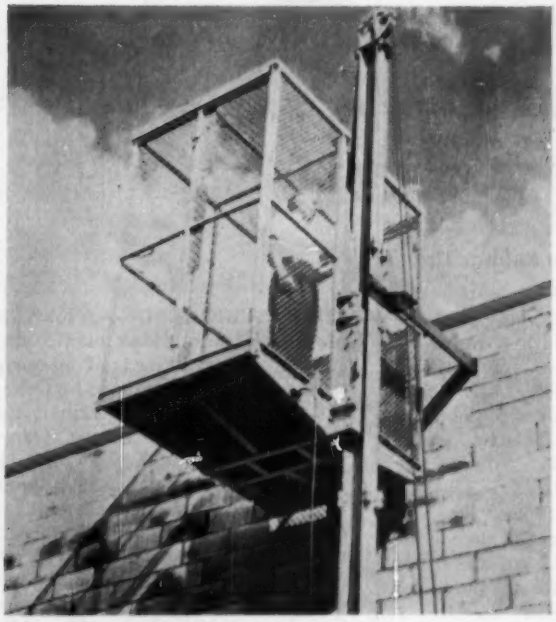


Drills 24-ft Ledges

The Davey M-8AL rotary drill, equipped with extra long bar and mast, drills 24-ft ledges without changing steels. The drill, easily mounted on any truck, utilizes both compressed air and high pressure water. Pump and compressor are driven by GMC engine.—**Davey Compressor Co., Kent, Ohio.**

Rides on Rubber

The Merton overhead loader, a rubber-tired unit made in England, mounts either a ⅞ or 1¼-yd bucket. Two double-acting rams provide complete hydraulic control of the bucket. The unit is powered by a four-cylinder Fordson Major diesel engine that develops 44 bhp at 1,700 rpm. A constant mesh transmission provides six forward and two reverse speeds. Top travel speed is 13½-mph. Standard model has totally enclosed, reinforced cab with large safety glass windows. Standard tires are 7.50x20, 10-ply, on the front wheels and 14.00x24 8-ply, on the rear. Turning radius to the outside corner of the bucket at ground level is 17-ft.—**Merton Engineering Co., Ltd., Faggs Rd., Feltam, Middlesex, England.**

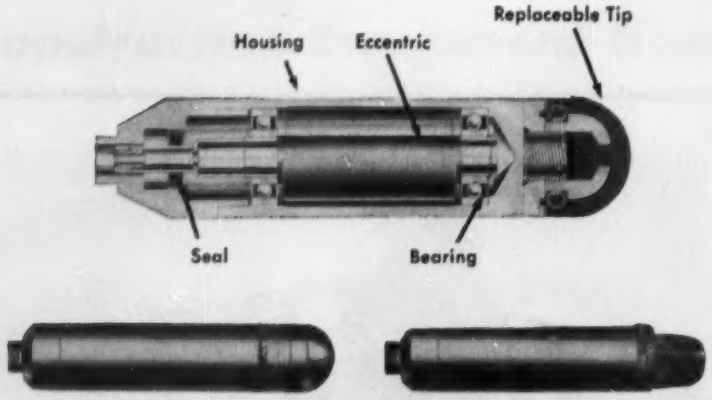


Lift Operates on Monorail

The Hawkeye monorail construction elevator is said to meet all state codes for passenger lifts. The 2,000-lb capacity elevator is easy to set up and operate, and it quickly can be moved to a new location. With a stabilizer every 15-ft, it can operate to virtually any height. A cam-action safety device halts the car within ¼ in. should trouble occur. Hoisting machnery is completely enclosed.—**Hawkeye Products Corp., Syracuse, N.Y.**

Gets Materials to the Job

The new model Tracto-Lift is designed to raise palletized masonry materials to heights up to 21 ft. A concrete bucket or a boom attachment for handling light steel erection jobs is also available. Big 14.00x24 tires on the front wheels—plus power steering—provide maneuverability and good traction over rough terrain. Shuttle transmission gives six speeds forward and reverse.—**Ottawa Steel Div., L. A. Young Spring & Wire Corp., Ottawa, Kan.**



SIMPLE DESIGN — Short head Viber vibrators are simple in design and have few parts as indicated in cut-away picture above. Head assembly with replaceable rubber tip is shown at left. Assembly with 3-finned steel-cast tip at right.

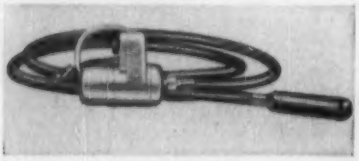
Short Head Viber Vibrators Offer Major Advantages in Placement of Concrete

VIBER VIBRATOR heads are short, easy to manipulate—simple, easy to maintain. Simple construction of the Viber head makes a compact assembly which maneuvers easily around steel and into awkward, hard-to-reach places.

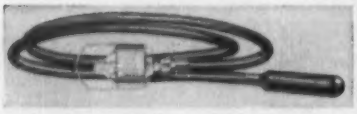
The Viber design utilizes a single eccentric weight in a heat-treated alloy steel housing. Other parts are one bearing at each end of the weight and a grease seal. Viber patented replaceable rubber tip is standard equipment, with 3-finned steel cast tip optional.

Viber heads are light weight, ranging from 6 to 16 pounds... 11 to 12 inches in length and are available in four diameters—1¾ in., 2⅛ in., 2½ in. and 3 in.

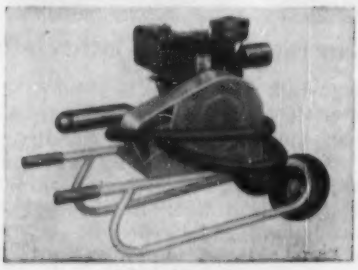
Flexible shaft driven, Viber vibrators are powered by electricity, gasoline or air... easily adapted to varying job conditions. They are high speed, operating at speeds between 8500 and 11,000 rpm.



Model E Electric



Model P Pneumatic



Model G Gasoline

Viber Replaceable Rubber Tips

Viber rubber tips save contractors thousands of dollars yearly by preventing damage to forms of plywood and other expensive materials. In addition, since most wear on a vibrator occurs on the end of the housing, use of replaceable rubber tips greatly extends housing life.

Viber vibrators are effective. More work can be done in less time and with minimum danger of damage to forms by using the high speed low amplitude type of vibrator pioneered by VIBER.

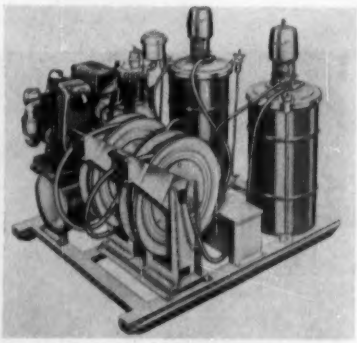
For complete information on Viber vibrators and address of nearest distributor, write Viber Company, 726 South Flower St., Burbank, Calif. Dept. 8E12.

VIBER

VIBRATORS SINCE 1931

EQUIPMENT NEWS . . . continued

PORTABLE SURGE BIN—Diamond's new portable surge bin will work with any type portable crushing or screening plant. The unit has an 11-yd hopper that receives the material processed by the crusher or screening plant. Trucks are loaded by means of its 36-in. wide conveyor. The unit is rated at 7 yd per min. The surge bin is clutch controlled from either a platform or the ground. The conveyor has a clearance under the head pulley of 9 ft 5 in. Power is supplied by an air cooled engine with fluid coupling.—**Diamond Iron Works Div., Goodman Mfg. Co., Halsted St. and 48th Place, Chicago 9, Ill.**



FIELD LUBRICATOR—A low cost portable lubrication plant, designed to be carried in pick-up trucks, has been produced by Graco Co. Called the Convoy Luber, the unit is mounted on a steel frame with hardwood skids that make it easy to load or unload from a truck body. The ready-to-operate luber comes with two hose dispensing reels, high pressure and low pressure Fire-Ball pumps, 7.5 cfm air compressor, and tool box.—**Graco Co., Inc., 1056A Sibley St., N.E., Minneapolis 13, Minn.**

NEW DETROIT DIESELS—Having their first public showing at the Road Show will be two new Detroit Diesel series 71 Turbopower engines and a 6-110 Roots blower engine. The new Turbopower engines are four and six cylinder units that utilize exhaust-driven

The 201-E is a highly portable plant. The frame is extra strong to hold rigid alignment of all equipment and drives. A rocker beam with full width axles supports most plant weight. Four wheels, each with dual tires, oscillate separately to compensate for rough terrain.

Push-button Controlled, Diesel Electrically Operated, and Portable AUSTIN-WESTERN 201-E high speed crushing plant

Need a high output, mobile crusher to furnish large quantities of accurately sized specification material at low cost? Then check the all new Austin-Western 201-E . . . Diesel electrified, push-button operated, portable, closed circuit crushing and screening plant.

Operation of all plant components is fully electric. Individual electric motors power all operations through short coupled V-belt drives. Mechanical loss through clutches, idlers, etc., is eliminated. Constant-top speed operations can be maintained at low cost.

A single, convenient push-button station controls the plant. Standard, interchangeable motors and electrical controls are used on the 201-E to eliminate costly down time.

Efficiency of the plant is increased by using these electric drives because all components operate at top efficiency at all times . . . regardless of crusher loads, thereby delivering top production of accurately sized aggregates.

These are just a few of the benefits that are yours with the *electrified* 201-E. Get the full story on the many ways this highly portable plant can boost your output of accurately sized specification material while cutting operating costs. See your nearby Austin-Western distributor . . . or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio, for illustrated booklet.

AUSTIN-WESTERN

CRUSHING, SCREENING AND WASHING EQUIPMENT

BALDWIN-LIMA-HAMILTON

Construction Equipment Division—LIMA WORKS

OTHER DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation • Hamilton • Lowry-Hydropress • Madsen • Pelton • Standard Steel Works

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

Anchor Bolts Help Provide Secure Roof in New Tunnel on Turnpike Extension

One of the features of the Northeast Extension of the Pennsylvania Turnpike will be the 4500-ft-long tunnel which is now under construction in a mountainous area near Bowmanstown, Pa.

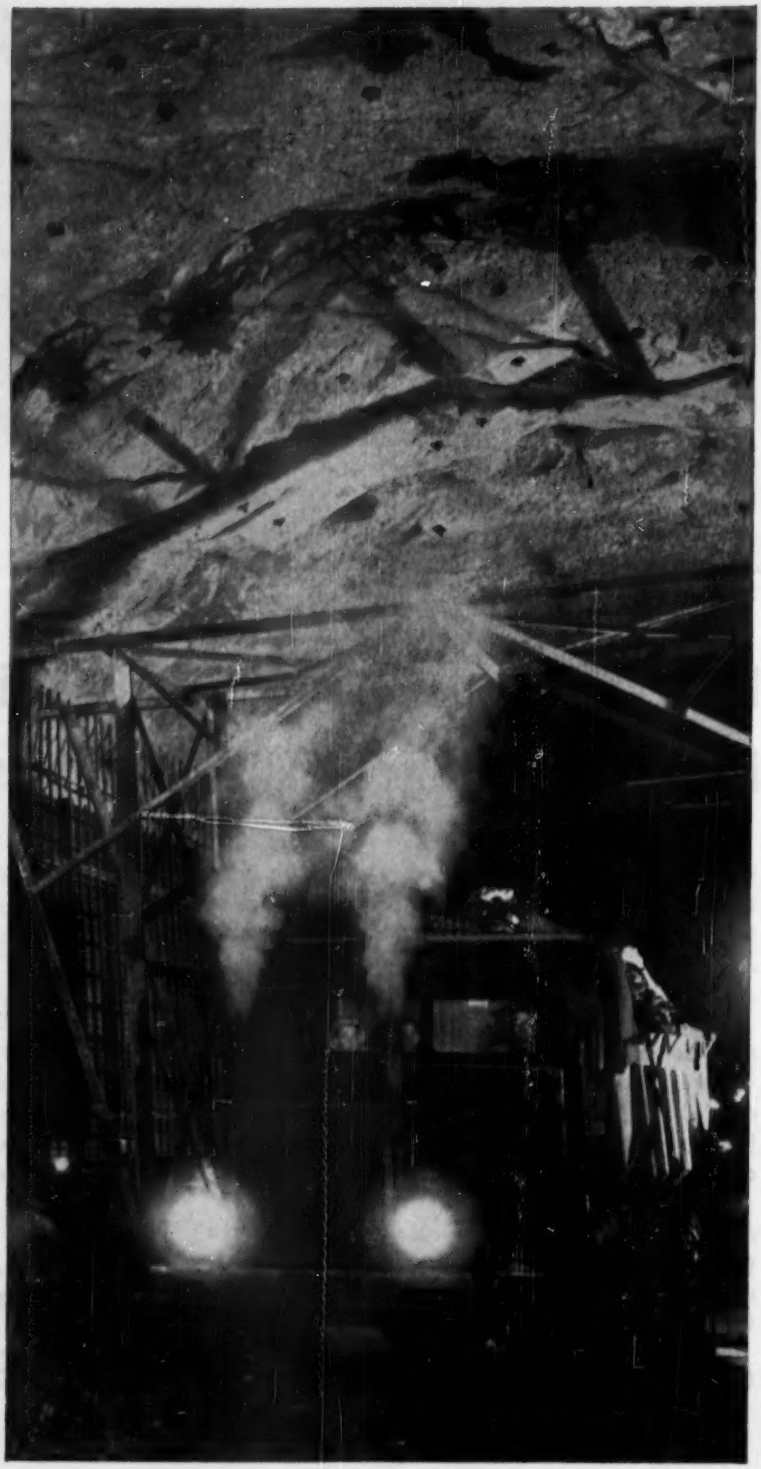
To help provide a sound roof the tunnel contractor, Lipsett Inc., New York, is installing approximately 900 Bethlehem Rock Anchor Bolts in the overlying strata. The slotted bolts, each 5 ft long and about 1 in. in diameter, are used in conjunction with steel wedges and square anchor-plate washers. In some areas, 12-ft roof ties are also used.

In addition to the slotted anchor bolt, Bethlehem produces a ¾-in. diam headed anchor bolt, which is used with a leaf-type expansion shell. Both the slotted and headed bolt come in varied lengths. They are ideal for supporting tunnel roofs, and for minimizing rock slides along highways, because of the effective way they bolt together the stratified slabs of rock. In addition to providing an excellent means of reinforcement, they also help to minimize maintenance costs.

Depending upon the type of rock face, Bethlehem Rock Anchor Bolts can be used with anchor-plate washers, angle washers, or steel ties. If you have any question about rock control in tunnels, or at danger areas along highways, drop a line to the nearest Bethlehem office.

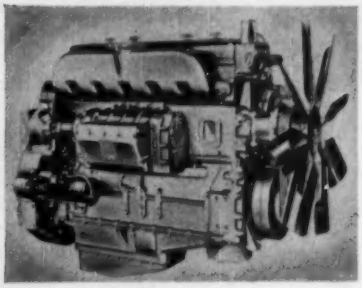
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

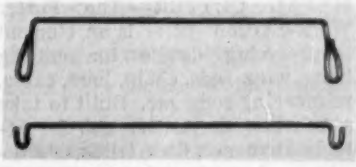


BETHLEHEM STEEL

BETHLEHEM STEEL



turbines and air impellers to supplement the air supply to the cylinders. The result is a 17% increase in horsepower or a 15% decrease in fuel consumption over corresponding series 71 diesels. These advantages have been attained with no increase in weight-to-horsepower ratios. The engines are rated at 171 and 236 basic horsepower. The new 6-110 engine, above, is equipped with a high-capacity blower similar to that used on series 71 diesels. Use of the blower reduces the height and length of the engine so that it is more compact and has more free space for accessory drives. The air supply to the cylinders is also increased for better performance at low-speed ranges. This engine has a basic rating of 300-hp.—**Detroit Diesel Engine Div., General Motors Corp., Detroit 28, Mich.**



SAVES FORMS—Two new base ties introduced recently by Symons eliminate the need for nails when erecting low wall grade beam forming. One tie is designed for use with Symons wood forms and the other for its magnesium and steel frame forms. Ties and wedges are all that is required to secure forms at top and bottom. The ties, because they replace nails, are said to materially increase the life of forms. Top ties can be reused indefinitely. The new ties are available in ½-in. multiples from 4 to 30 in.—**Symons Clamp & Mfg. Co., 4249 Diversey Ave., Chicago, Ill.**

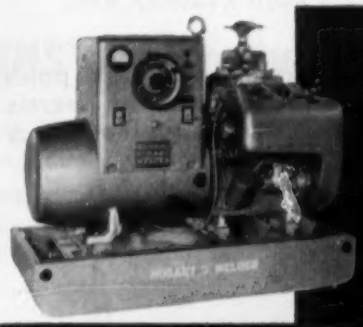
EASY ON CABLE—The new Owen SCL material handling bucket features a closing line lead that goes straight through the center plane of the bucket to the first

Jaeger pumps know how to handle water

Two independent, simultaneous priming actions . . . fast and doubly sure. • Oversize shells and impellers, engines of largest horsepower applicable. • The only positively lubricated shaft seal with ready inspection port. • Prime without racing, pump at slower speeds, pump more thousands of hours. Performance guaranteed. Sizes 1½" to 10". See your Jaeger dealer or send for Catalog P4.

THE JAEGER MACHINE COMPANY • 800 Dublin Ave., Columbus 16, Ohio

COMPRESSORS • MIXERS • TRUCK MIXERS • SPREADERS • FINISHERS • LOADERS



for fast on the job

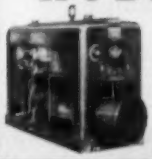
ac welding

Welds anywhere—saves costly tear-downs and expensive parts

ac power

furnishes 110 volt current for tools, lights, motors, etc.

Cut Costs with a HOBART



There's a size and type to meet every welding requirement

Lightweight air cooled "Husky Boy" DC Welder

Use the coupon no obligation

Here's a valuable 2 in 1 unit that's always ready on a moment's notice to go to work for you. Lets your own men do repair work quickly and easily without costly shut-downs. You can save hundreds of dollars by doing your own welding with a unit that also furnishes power for operating auxiliary equipment. You wouldn't be without this valuable combination unit once you've seen and tried it. No obligation—why not mail coupon today for complete information.

• To HOBART BROTHERS CO., Box 6126, Troy, O.

Without obligation, send complete information on the following:

_____amp. capacity ☐ AC Welder-AC Power Combination ☐ Standard DC Engine Drive Welder ☐ "Husky Boy" air cooled DC Welder

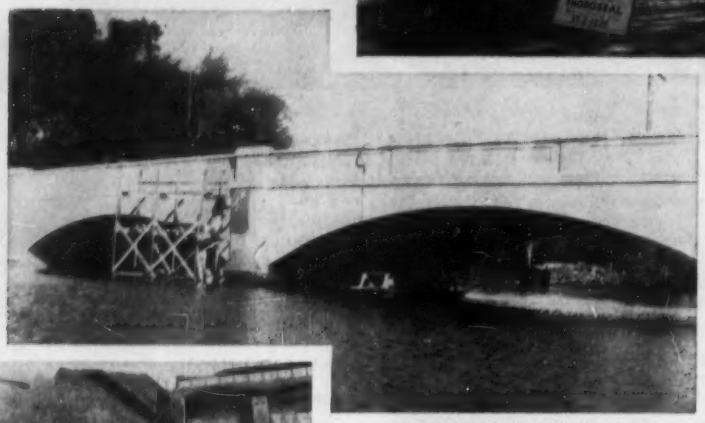
NAME _____ POSITION _____

FIRM _____

ADDRESS _____

It's New Again with THORITE and THOROSEAL

Freeze-thaw cycle following water and moisture penetration, also swelling of reinforcing rods from moisture contact, cause masonry destruction.



BRIDGE OVER CONCORD RIVER
ROUTE 3, BELLERICA, MASS.

Workmen on scaffold patch spalled and cracked concrete with THORITE and seal surface with THOROSEAL.

Area at left chipped to sound masonry. It will then be patched with THORITE *Nonshrink, Non-slump 20-Minute Set Patching Mortar*, without necessity of costly forming, finished by application of Thoroseal.

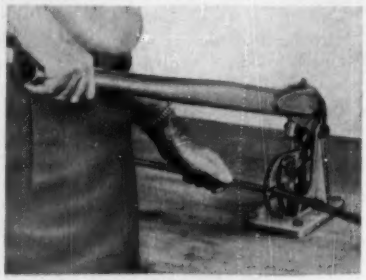
Request Circular No. 16 and 20.

Write for our 16 page "How to Do It"

STANDARD DRY WALL PRODUCTS, INC.
NEW EAGLE, PENNSYLVANIA · CENTERVILLE, INDIANA

EQUIPMENT NEWS . . . continued

lower sheave. This eliminates much of the bending of the closing line around the guide sheaves that is common in conventional block and tackle and lever arm buckets. Cable and roller wear is further reduced through the use of longer, larger diameter, three-sectional bronze bushed rollers in the head. Other features include high-mounted center weight sheaves that avoid contact with material; longer hinges and larger bearings to increase the open width of the bucket when loading; built-in sheave guards that permit reeving without removing the sheeves; and an all-welded crosshead that is lighter and stronger than cast steel crossheads. The buckets are available in a wide range of sizes from ¾ to 3-yd capacities.—**The Owen Bucket Co., 6020 Breakwater Ave., Cleveland, Ohio**



METAL CUTTER—The Porter Work-Station cutter is an efficient labor-saving device for cutting bolts, wire, rods, chain, bars, cable, reinforcing rods, etc. Built to take a beating, the cutter can be attached to bench, floor, truck, or anywhere where there is a cutting job to be done. The long handle makes it possible to cut hard metals with one hand, leaving the other hand free to feed materials. It can be equipped with various types of jaws in two sizes, depending on material to be cut.—**H. K. Porter, Inc., Somerville, Mass.**

SWEET LORAIN—The air-controlled 1½-yd Lorain-56 is the newest of Thew Shovel Co.'s line of Lorain power shovels and cranes. Convertible to shovel, crane, clamshell, dragline, or hoe, the model 56 incorporates Lorain's patented two lever, "metered-air" controls; "air-ease" power crawler controls; "shear-ball" mounting that eliminates center pin and nut, centering gudgeon, and turntable rollers; and Lorain's lightweight,

Continued on page 150

Courtesy: Link-Belt Company

Ray-Man Belt "TRAINS" Naturally and Hauls Full Loads

Engineered features of Ray-Man Conveyor Belt give it the easy troughability and wear resistance to handle the heaviest loads. Special cushioned strength members and strong, yet resilient synthetic outer plies provide compensation to give this belt unusual flexibility. It permits full loads even where thick, narrow belts are used, or where belts must round small pulleys. Ray-Man Conveyor Belt requires no breaker strip . . . yet it resists gouging, tearing and ripping from large, abrasive lumps better than other constructions. It holds fasteners under the most severe operating conditions.

Ray-Man is mildew-proof and moisture resistant. Like other Manhattan heavy duty conveyor belts, it features R/M's exclusive "XDC" Cover which gives it protection against wear, tear, cuts and abrasion never before possible. We say Ray-Man Conveyor Belt gives you "More Use per Dollar" because it does a better job . . . and it *lasts longer.*

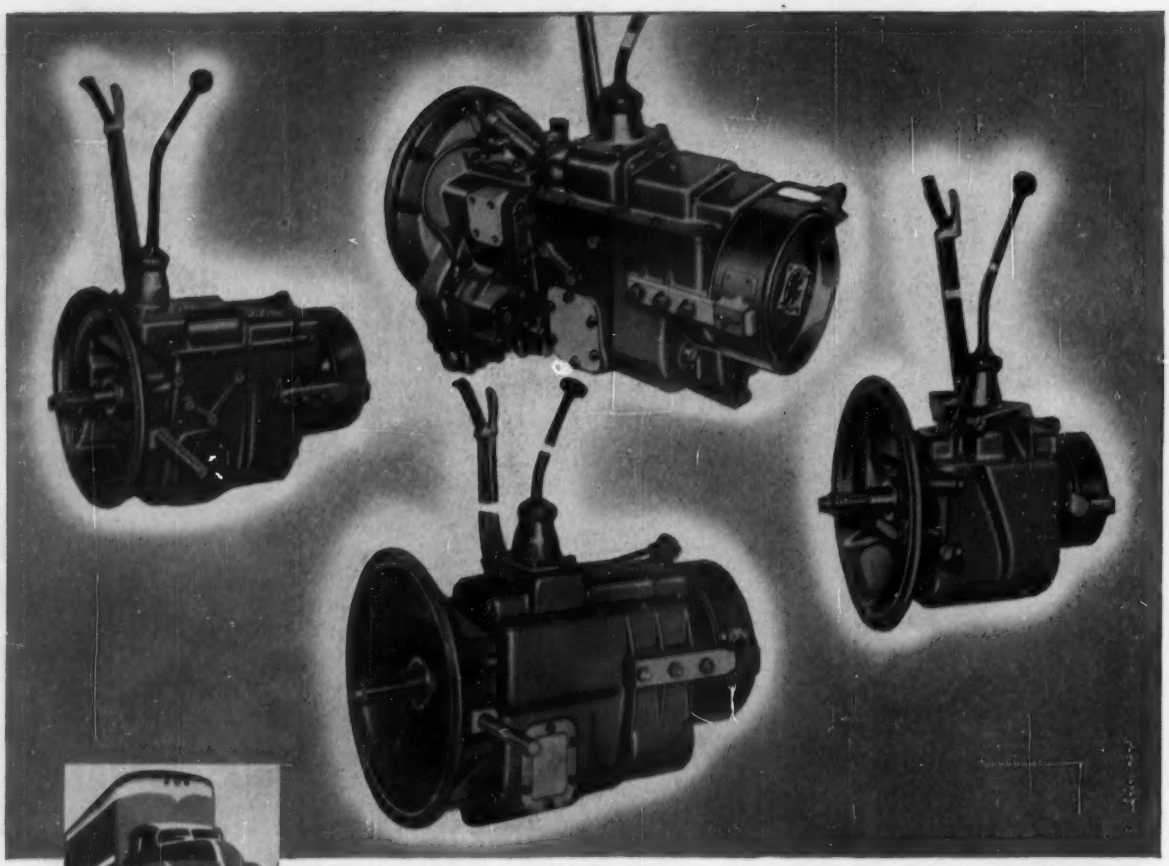
Let an R/M representative show you the advantages of Ray-Man as well as other R/M feature conveyor belts . . . extra-cushioned Homocord, for unusually abusive shock loading . . . R/M Tension-Master for extra long lifts and high tensions. For the best conveyor belt to meet your job requirements . . . for "More Use per Dollar" . . . contact an R/M representative today.

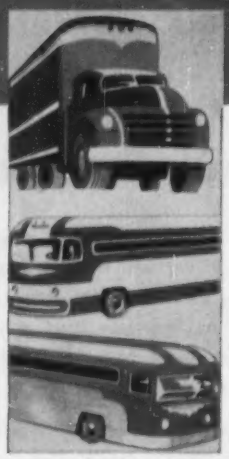
RM-605

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings • Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Laundry Pads and Covers • Bowling Balls





POWER TRANSMISSION?

start from scratch . . . WITH CLARK

It's a far cry to days when a transmission was an individual component—a set of gear ratios in a box.

Today it's a vital member of a power-transmission team, engineered to perform a specific assignment in a vehicle that works for somebody's living: a highway hauler, a bus, or an off-highway machine.

Talk to Clark.

Have you a new model in the drafting stage?—or an existing one in need of face-lifting? Clark either has a unit to meet your need, or can design one—from transmission to complete power train.

Here is a full half-century of operating experience in that vital area *from engine flywheel to point of torque application.* That fund of knowledge is yours to command.

Talk to Clark. A handy-sized booklet tells what products Clark manufactures; explains, also, why many leading vehicle builders call it "good business" to do business with

CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY
TRANSMISSION DIVISION
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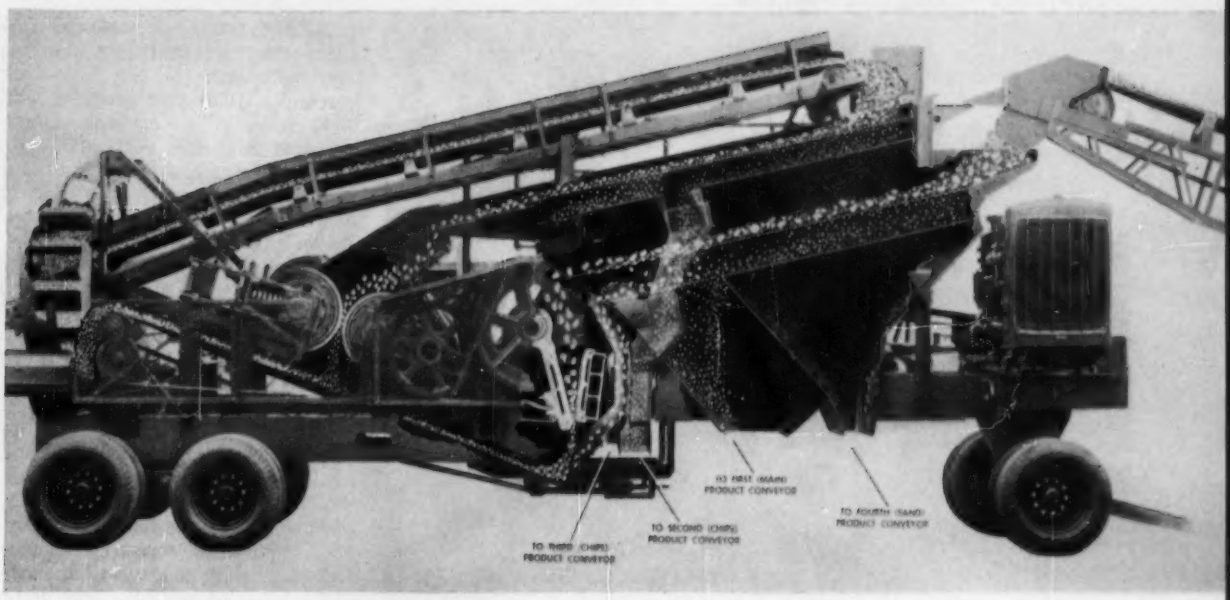
TO FIRST (SAND) PRODUCT CONVEYOR
TO FOURTH (SAND) PRODUCT CONVEYOR
TO SECOND (CHIPS) PRODUCT CONVEYOR
TO THIRD (CHIPS) PRODUCT CONVEYOR

Portable plant's 4x12-ft four-deck screen . . .

Produces Four Materials at Once

HOW DO YOU turn out profitable quantities of big-size aggregates or armor-coat chips from a pit where dirt and fines make up 60% of the material that enters your rock plant?

Because many pits in the Southwest run that heavy to fines, this is a problem that has plagued contractors in that area for years. The only answer, of course, is to find a plant with the screening capacity necessary to turn out the great quantities of raw materials needed to get good aggregate sizes.

According to Walter Norton, boss of the Arrow Construction Co. of Yuma, Ariz., a new series of gravel plants recently introduced by the Pioneer Engineering Works may provide relief for contractors in the Southwest and in other areas.

Pioneer's new line of portable duplex-type gravel plants — all equipped with 4x12-ft four-deck vibrating screens—allows simultaneous production of from one to four sizes of closely graded material. Flexible screening and spouting arrangements, and full deck scalping ahead of the primary crusher, add versatility.

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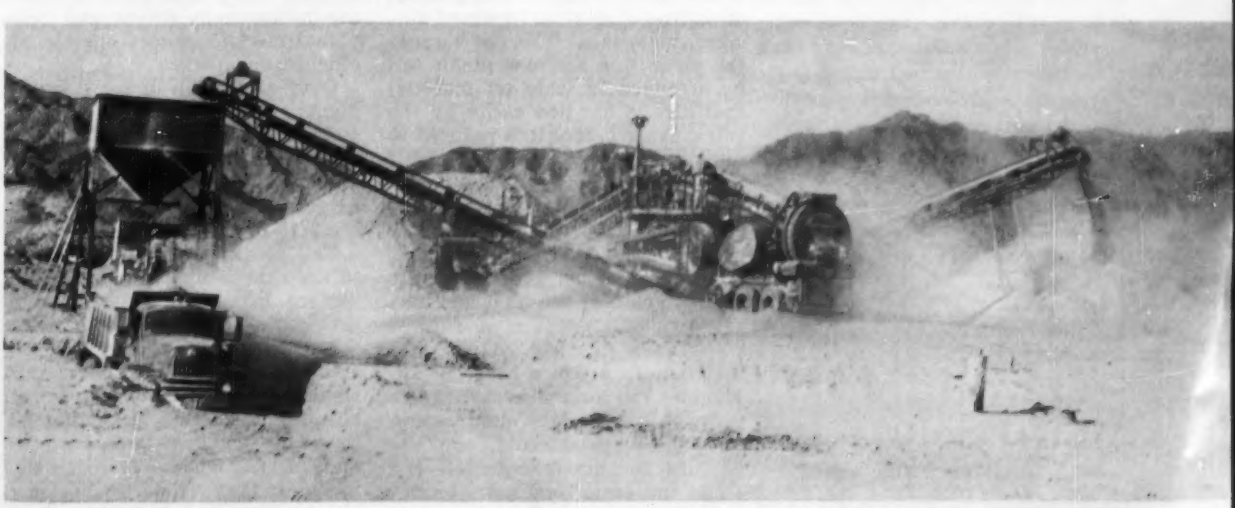
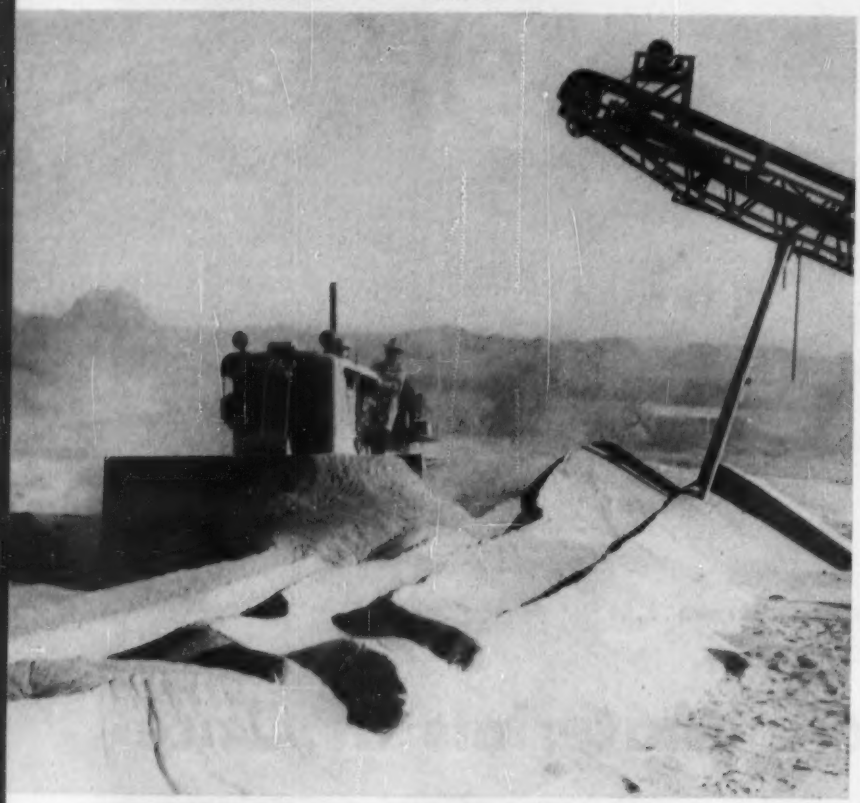


TYPICAL OF PITS in many parts of the Southwest, this one at Yuma, Ariz., actually delivers more fines than aggregates. Pioneer's new rock plant processes the high hourly tonnages necessary to produce profitable quantities of ⅜-1½-in. aggregates.



DOZER MOVES fines from waste conveyor of Pioneer 44V plant—said to have biggest screen of any portable. At Yuma, it processes 435 tph of raw material to get big-size aggregates.

The 4x12-ft, four-bearing, four-deck vibrating screens that are standard on all the new plants are said to be the largest ever used on portable equipment.

Last summer Arrow set up one of the new duplex-type plants at a pit near Yuma, Ariz. Since that time, it has been handling up to 435 tph of raw material and turning out profitable quantities of high-grade aggregates and chips. These include base course aggregates in the ⅜ to 1½-in. range.

The flexibility and capacity of the Pioneer 44V gravel plant make it ideally suited to Arrow's needs, according to Norton. For one thing, Arrow is no longer wasting great quantities of small to intermediate-sized materials. This is because the screens on the new plants can be arranged to scalp off material that can be handled easily by the roll crusher before it is reduced to fines by the jaw crusher. This is possible because the third deck can be used as a scalping screen to by-pass materials around the jaw crusher.

The plants can produce up to four products at one time, and they can turn out two sizes of crushed chips simultaneously. Arrow uses its plant to produce concrete aggregates and rock chips at the same time. It also has been used to turn out two types of sand, one size of chips, and sub-base gravel—and all at the same time.

Another important feature, as far as Arrow is concerned, is the plant's extreme portability. Despite the fact that the plant is equipped with the big four-deck screen, a 1036 jaw crusher, and 3042 rolls, it is compact enough to meet highway restrictions on width, weight, and load. The plant also can be changed over quickly as the nature of the job changes. As an example, Arrow's plant finished up a chip production job for the Arizona State Highway Div. on a recent Thursday and on the following Monday it was crushing to an entirely new set of specifications for the California Highway Div.

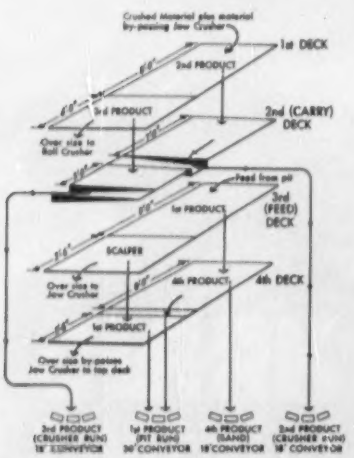
Pioneer's new line is built around two basic models: the 44 series, which mounts a 3042 twin roll crusher; and the 45 series, which has a 4022 twin roll crusher. Both series use the 1036 jaw crusher, a four-deck screen with secondary spring suspension mounting, and a bucket wheel elevator for transfering materials.

The secondary suspension mounting increases the screen's efficiency by eliminating restrictions on screen movement. It also limits vibration transfer to the supporting structure. By using a bucket wheel conveyor instead of a long return conveyor and transfer spout, recirculating efficiency has been improved.

Arrow's plant has one Cat D326 diesel to drive the screen assembly and jaw and roll crushers, and another D326 with a 100-kw electric generating set to supply power for lights, conveyor motors, and washers. Other models are powered by on-plant or off-plant diesels, and either series can be equipped with electric drives. On electrified models only the jaw and roll crushers are mechanically driven and individual electric motors operate all other components.

Over-all lengths of the standard plants are 32¼ ft for the 44 series and 29 5/6 ft for the 45 series. Over-all traveling width of all plants is only 9½ ft. Operating height is 14 2/3 ft and travel height is 13 ft for both series.

The plants have been designed to keep the weight of rear equalizer loadings below 34,000 lb. Approximate total weight of both series is 60,000 lb with a semi-trailer hitch and 62,700 lb with single-axle dolly. For the 44 series, this includes a power unit on the plant, and fuel tank, batteries and guards. On the 45 series this includes the standard shortened plant with a jackshaft drive from off-plant power source.



SCREEN ARRANGEMENT produces two crusher runs, one pit run, and sand.

Now despite skyrocketing costs... International gives you

...UP TO 24% MORE FOR YOUR POWER DOLLAR

IN 6 NEW CARBURETED POWER UNITS!

Your choice of fuel

International's adaptable design permits you to take advantage of your local fuel situation and select either gasoline, LPG or natural gas equipment in all six power units.

Now...you can get up to 24% more for your power dollar! International gives you this horsepower bonus, plus additional *new* savings on fuel, and *extra* life in six new, heavy-duty, 6-cylinder carbureted power units, from 68 to 133 net hp.

Horsepower increases and lower prices result from money-saving mass-production techniques unrivalled in the industry. Three of the power units, the U-264-6, U-308, and U-370 are *special* adaptations of heavy-duty International truck engines—proved for top *worry-free mileage*, and *record ton-mile economy!*

So, compare low first cost per working hp of these new International units with any other make. And compare such International *bonus* features as positive, unfailing lubrication through rifle-drilled oil passages... famous International valve-in-head operating efficiency ...power-smoothing, counter-balanced forged crankshafts ...and positive, "filter-clean" crankcase ventilation. Prove you'll get more dependable hp per dollar...more profits to depend on from every dollar you invest. Compare soon—see your International power unit distributor.

Brief Specifications (Gasoline)*

Model	Net hp and rpm	Max. torque lbs.-ft.	Displacement	Bore & Stroke
[illegible]	68 @ 2400	177	220.5	3 7/16 x 3 11/16
[illegible]	78 @ 2400	192	264.3	3 11/16 x 4 1/8
[illegible]	87.5 @ 2400	229.5	308.2	3 13/16 x 4 1/2
[illegible]	104 @ 2200	288	372	4 3/8 x 4 1/8
[illegible]	126 @ 2200	323	450.9	4 3/8 x 5
[illegible]	133 @ 2200	384	500	4 1/2 x 5 1/4

*Complete specifications and ratings on LPG and natural gas available on request.

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors... Self-Propelled Scrapers and Bottom-Dumps... Crawler and Rubber-Tired Loaders... Off-Highway Trucks... Diesel and Carbureted Engines... Motor Trucks.

INTERNATIONAL® CONSTRUCTION EQUIPMENT

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TURNPIKE TESTS PROVE:

"75" PAYSCRAPER®

CARRIES

12% more...

DELIVERS IT

15% faster

. . . . .

TD-24 push

An International TD-24 tractor and "75" Payscraper recently out-pushed, out-loaded, and out-sped all equal-sized competitive units in accurate on-the-turnpike tests. This data was obtained on the Illinois toll road job near Rockford.

All tests were conducted under similar conditions on the same cut, in the same material, and under the supervision of the contractor's grade foreman. Loading time was limited to exactly one minute. Scraper loads were weighed on special new accurate scales. Haul length was held to 2,000 feet for all scrapers.

Final figures amazed all observers! Results showed first, that *the "75" Payscraper carried 12% more dirt per load...delivered it 15% faster than the other two scrapers tested;* second, that *the TD-24 torque converter pusher heaped an average of 1.2 cu yd extra into all scrapers tested.* (See charts, at right.) A competing manufacturer substantiated these same figures!

Here's conclusive proof that no matter what scraper the TD-24 pushes, you load more in any given time... and that the "75" Payscraper carries more, no matter what pushes it! And that the TD-24 and "75" Payscraper, teamed together, out-produce other equipment combinations with faster loading, bigger loads, and all-around faster cycles.

Prove the stand-out pushing, loading, and cycle-speeding performance of the International TD-24 tractor and "75" Payscraper on your own jobs. Ask your International Construction Equipment Distributor for a demonstration!

Load-Speeding Action. High horsepower-to-weight ratio and speeds up to 24 mph—plus operating ease of air-assisted clutch; big, safe, 4-wheel air brakes; exclusive Hydro-Steer—all help the Payscraper gain time, increase earth-moving capacity!

Clipboard in Hand, equipment engineer signals "75" to begin controlled one-minute push-loading from TD-24 torque converter tractor. Although TD-24 push-packed an average 1.2 cu yd more in all scrapers, it loaded 2.1 cu yd more in "75" Payscraper, than competing pusher!

h loads 1.2 extra yds. into all scrapers!

PAYLOAD TESTS (average)

Pusher	International "75" Payscraper	Scraper "A"	Scraper "B"
International TD-24 Torque Converter tractor	20.6 cu. yd.	18.2 cu. yd. "75" bonus 2.4 cu. yd.	17.5 cu. yd. "75" bonus 3.1 cu. yd.
Pusher "A"	18.5 cu. yd.	17.0 cu. yd. "75" bonus 1.5 cu. yd.	17.1 cu. yd. "75" bonus 1.4 cu. yd.

CYCLE TIME TESTS (average)

International "75" Payscraper	4.8 min.
Scraper "A"	5.7 min.
Scraper "B"	5.6 min.

"75" Payscraper Proves 15% faster ... delivers up to 19 extra loads per 10-hour day

See you at the ROAD SHOW—CHICAGO Jan. 28-Feb. 2, 1957

INTERNATIONAL HARVESTER

INTERNATIONAL Construction Equipment

International Harvester Company, 180 N. Michigan Avenue, Chicago 1, Illinois

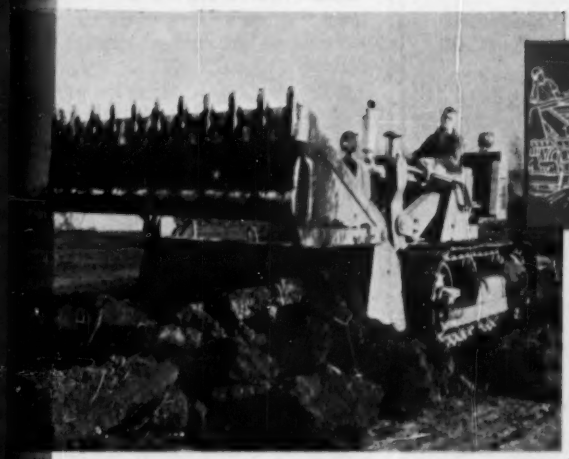
A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks

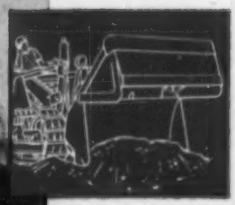
get exclusive 4-machine utility... finger-tip easy...

in all International Drott 4-in-1 Skid-Shovels!

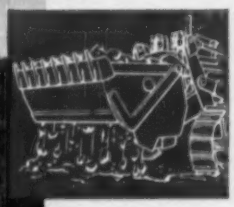
You get famous Skid-Shovel triple-power pry-over-shoe break-out action

...plus 42° ground-level bucket roll-back...simply by moving a lever with finger-tip ease...stopped or on the go. You can also use fast, depth-controlled Drott straight-forward bucket loading—and time-gaining, strain-saving skid-shoe load transport! You get this concrete-shattering break-out power, this stepped-up excavating and material-handling capacity, *only in the 4 International Drott Four-In-One sizes!* It's the 3-yard TD-18 Four-In-One, shown, breaking up concrete slab!

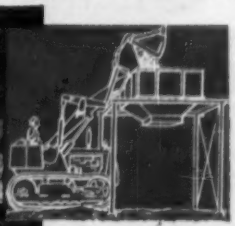




For big bulldozing capacity, just move the Four-In-One's machine-selector lever to open the clam hydraulically. Then you regulate dozing depth, easily and accurately, by hydraulic radius control of blade pitch (forward or backward)—to roll earth, to backfill, grade or spread with precision. Watch this TD-14 Four-In-One as a dozer—stripping hard-frozen top-soil, 8 inches deep—keeping construction rolling, even in cold weather. *This responsive, large capacity bulldozing action, Drott-developed, is another Four-In-One exclusive!*



Nobody but International Drott gives you Four-In-One Bullclam versatility, to strip, grade, spread, or compact with inch-close accuracy—to put regular "carry-type scraper" action at your finger-tip command! See how positive clam lip control enables the Four-In-One Bullclam to heap-load itself, with fast, earth-boiling action. Then it's easy to dump the material all at once, or spread it evenly. Use the load-weighted bucket, and hydraulic down-pressure, too, for positive fill compaction. Here's the new bonus-powered TD-9 with 1½-yard Four-In-One working as a multiple-duty Bullclam.



See how you quickly switch to clamshell action to "surround" loose material, get instant bucket-fill in one fast gulp, and save hand labor on clean-up work. You can also use the Four-In-One clamshell position for big-capacity stockpile material handling. And the versatile Four-In-One clamshell, as a bottom-dumper, gives you a 2½-foot dumping height advantage over ordinary roll-forward buckets! Yes, and bottom dumping assures you positive bucket cleanout, even of sticky clay or gumbo! Only an International Drott Four-In-One gives you this *built-in, job-getting clamshell action.* Here's the 1-yard TD-6 Four-In-One "cleaning up" around a foundation.

And besides 4-machine utility,

each Four-In-One model also gives you all the other famous International Drott exclusives! Exclusive shock-swallowing Hydro-Spring that reduces impact force effects by 67%, or more—also greatly extends hydraulic hose life. Exclusive *heap-keeping* parallelogram lift action. Exclusive attachments: like Skid-Grapples, Grubber Blades, Rock Forks, and others—to multiply usefulness. See your International Construction Equipment Distributor and see the movie, "Versatility Unlimited." Then ask for a Four-In-One demonstration!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wis.

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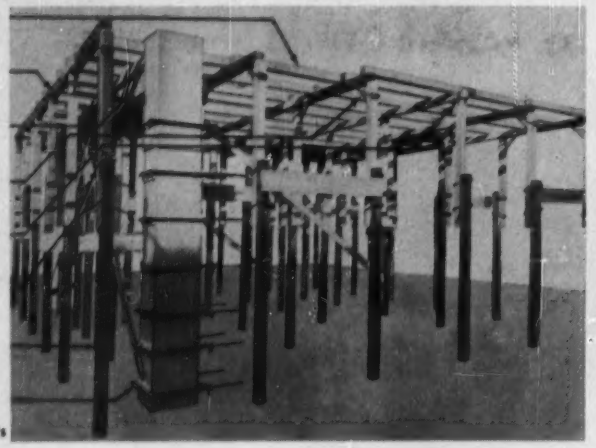
CHICAGO
Jan. 28-Feb. 2, 1957

The Perfect Set-up FOR FORMING A SUSPENDED REINFORCED CONCRETE FLOOR



Ellis Methods Provide the Greatest Speed and Economy!

This typical arrangement shows how simple it is to erect forming members using Ellis Methods. End assemblies, each consisting of a short purlin and two shores, are assembled on the ground, raised and braced. Longer purlins connect these, slip-in shores are added between, and joists laid across the top. Held together by Ellis Adjustable Clamps, wood members are interchangeable and have more than 10 times the life of forming lumber used under ordinary methods, making big savings of material. Ellis Beam and Column Clamps are used on all beam and column forms. The entire assembly is simply laid together—"up and down" fast—resulting in great labor economy.

Ellis MFG. CO., INC.

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NO NEED for this—
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Miller Tilt-Top's faster loading, precise easy backing, on-a-dime maneuverability, cuts time between jobs . . . ups your *profit*—production time for men and equipment every day! One man can tilt, simply drive the equipment onto the broad oak decked platform in less than two minutes! You save the slower loading cost of more cumbersome trailers and tractors . . . are able to choose from several different Tilt-Top models, from 3 to 16 Tons capacity. See these ruggedly built, production boosting Tilt-Tops at your Miller distributor today—you'll be surprised at how little they cost!

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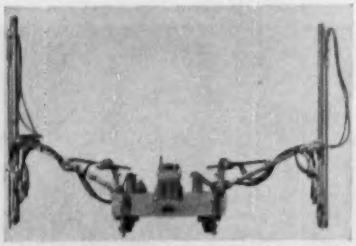
Miller Tilt-Top Trailer Co.

457 S 92nd Street, Milwaukee 14, Wis.

all-welded crane boom with square-tubular main-chords and round-tubular lacing. Crawlers 14-ft long in widths of 11 ft 4 in. and 13 ft are available. Standard tread width is 30 in., and 42-in. tread widths are available as optional equipment. The crawlers feature sealed tread rollers. Shovel boom is 21 ft long. A 17-ft stick is equipped with air dipper trip and air crowd and retract. The hoe boom is 23 ft long with a 7-ft stick. Dipper widths range from 36 to 48 in. Power is supplied by a Cummins diesel engine equipped with torque converter and a disconnecting two-plate clutch. — **Thew Shovel Co., Lorain, Ohio.**



DUAL DRILLING RIG—LeRoi's newest dual drill rig is said to have one of the most variable drilling patterns yet attained. Two 7-ft arms, mounted on swivel heads, allow an arcing of the arms that provides a drilling pattern with a 24-ft spread. The radius of turn of each arm is 220 deg from the mounting posts. Called the T286, the crawler-mounted drilling rig mounts the new DR40 feed, which has 10-ft travel and 8-ft steel change as standard equipment. This feed allows the use of either a 3½ or 4 in. drifter. The new drill rig can be purchased with one or two LeRoi-Cleveland air feeds mounted on a crawler tractor powered with a 28-hp gasoline or diesel engine. The upward and downward positioning

of the arms is done by an air motor. Positive lubrication of the drills is handled with 2-gal line oilers, which require only once-a-day servicing. The tractor, which has three forward speeds and one reverse speed, can be used for light tractor work when not drilling because the arms are easily removed from the mounting posts. The tractor is equipped with either rubber or steel cleats.—**LeRoi Div., Westinghouse Air Brake Co., Milwaukee, Wis.**

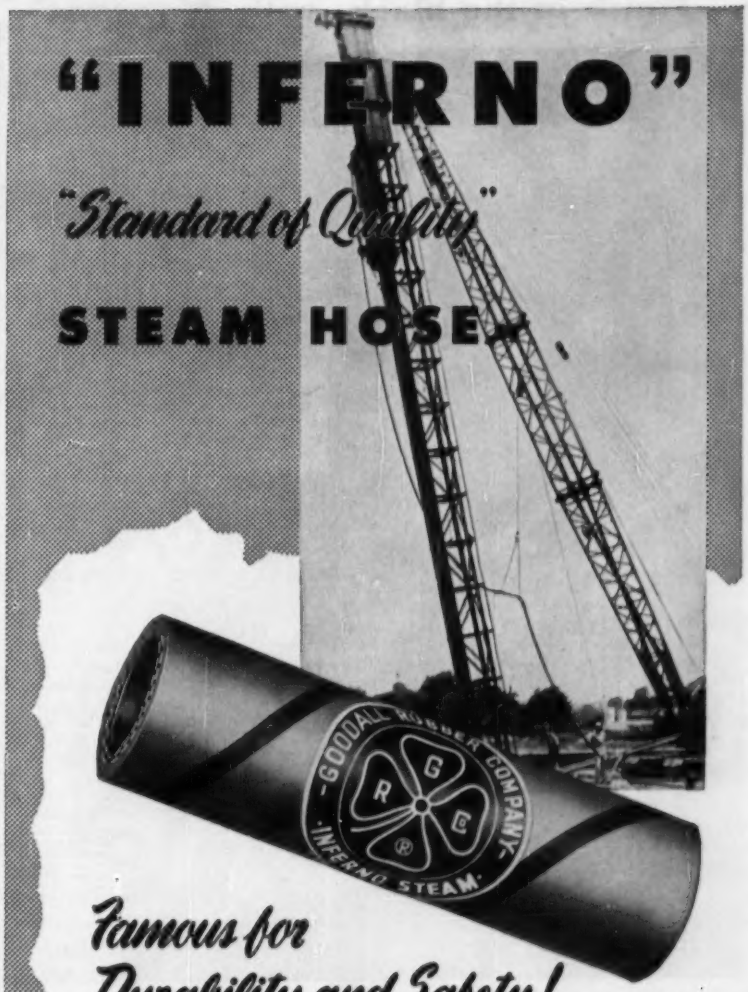
PAYLOADER BACKHOE—A ¼-yd backhoe is now available for Hough Payloader models HH and HU tractor-shovels. The Wain-Roy backhoe is a completely independent unit that replaces the Payloader bucket quickly and easily. It is attached to the boom arm with only two pins and the hydraulic hose connections. The backhoe which digs and dumps within a 190 deg radius, has a 12 1/3-ft reach, a 13-ft digging depth, and a 9-ft loading height. Twin boom cylinders provide powerful down pressure and breakout force. The bucket comes in 14, 18, and 24-in. widths. — **Wain-Roy Corp., Hubbardston, Mass.**

PORTABLE PLANT — Within hours after it is delivered to a location, the high-capacity Burmeister concrete batching plant can be delivering over 100 yd per hr. All that is required is a source of water and power. No field wiring or plumbing is necessary and there are no pits to dig. The plant consists of a 130-ton capacity, three-

"INFERNO"

"Standard of Quality"

STEAM HOSE



Famous for Durability and Safety!

Contractors *know* that when they put "Inferno" on the pile-driving rig, the job will keep going at a steady, profitable pace, with no question of bursting and its costly consequences. Record speeds and depths of drive have been made many times with this extra-strong, extra-durable steam hose . . . easily identified by the Goodall "Cloverleaf", and a black spiral stripe on the familiar red cover.

"INFERNO" STEAM HOSE specifications include high-temperature tube; multiple-layer, braided steel wire carcass; wear-and weather-resistant "Synplastic"® cover. Sizes ½" to 3", inclusive, in maximum lengths of 50 feet.

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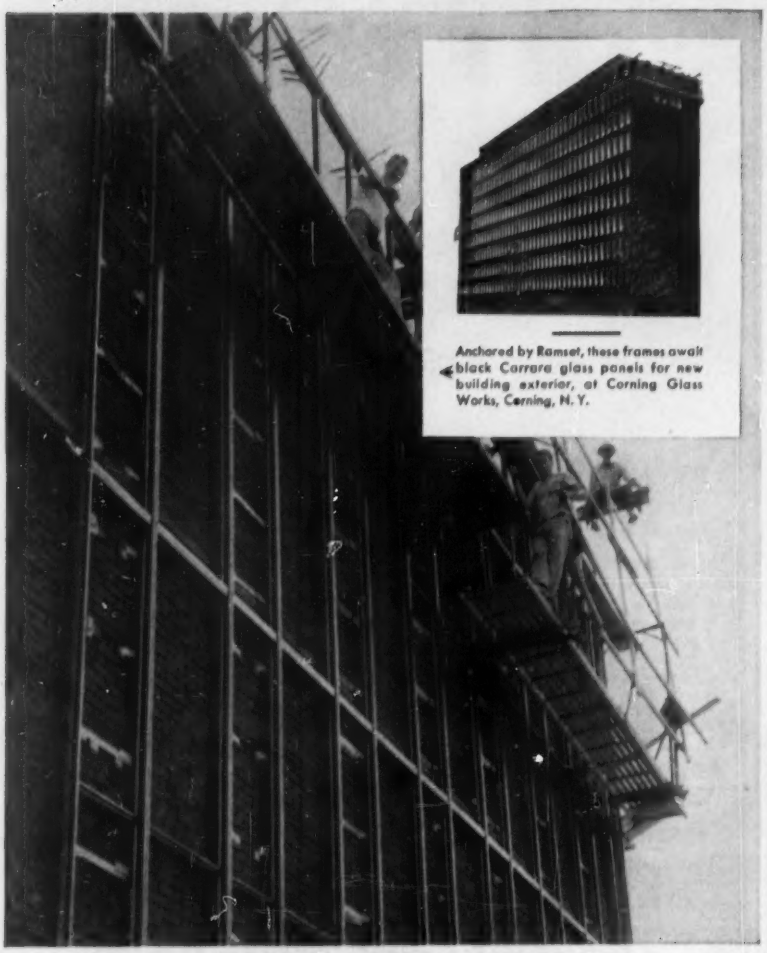
Finish in the black—with *Ramset*



Anchored by Ramset, these frames await black Carrara glass panels for new building exterior, at Corning Glass Works, Corning, N. Y.

Ramset fastens glass wall 20% faster

On this new building for Corning Glass Works, RAMSET anchored the clips and sash faster, easier and with better results than old-style methods.

Workers like RAMSET because it is easy to use—no hose or wires to drag, no equipment to attach. *Contractors* like RAMSET because it is fast and flexible—usable on all concrete and steel materials. *Architects* like RAMSET because it is neat and versatile; eliminates need for pre-set bolts or pre-drilled holes.

The entire exterior of this building is of glass. RAMSET attached 5/16" aluminum sash to 1/4" clips set into the brick wall.

Whatever your fastening problem—duct work, pipes, conduit, furring strips, flooring—you will find RAMSET does it quicker, easier and better.

YOU will like RAMSET because it saves time, money and effort. It is the modern way for modern construction methods. New catalog tells the whole story. Write for your copy today.

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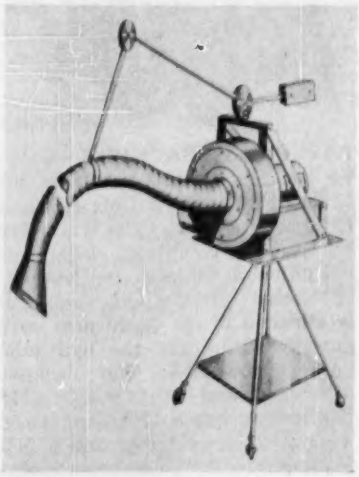
12103-L BEREA ROAD • CLEVELAND 11, OHIO

compartment aggregate bin complete with batchers and scales; a portable belt conveyor on wheels; and a portable Burmeister Weigh-Meister batching unit. The entire unit requires the attention of only one man, who operates the plant through a centrally located push-button panel. An interlocked cycle makes it impossible to batch incorrectly. Other features of the plant include plug-in type electrical and air connections; an air compressor, water pump, and meter as standard equipment; an aggregate bin with hinged sides for low clearance when being transported; and a cement hopper that holds 350 barrels. **—L. Burmeister Co., Milwaukee, Wis.**



PORTABLE EXHAUSTER—The W-200-50 stand-type exhauster can be wheeled anywhere in the shop to suck up fumes that otherwise might build up and become unpleasant, if not dangerous. Movable on steel casters, the exhauster is designed to go close-up to the fume site, apply a high suction, and then to push the fumes to the nearest outside opening. The unit consists of either a gasoline or electrically driven blower and an 8-ft stainless steel hose assembly with counterbalance that can be positioned universally. Available hose diameters are 4, 6, and 8 in.**—Engwald Corp., 357 Lafayette Ave., Brooklyn 38, N. Y.**

COLD-WEATHER STARTER—The new Zero-Start external tank-type engine preheater is easily and quickly installed on any liquid-cooled engine by connecting it to the block drain. Engineered to give

Four-wheel drive, and tires 2' wide, give Tournatractor ample traction to make full use of its 208 hp.

Root-Rakes

Here's what high-speed on rubber can do for you

Tournatractor, with 17 mph forward speed and 8 mph reverse speed, can do many tractor jobs twice as fast as a crawler-tractor.

Drives anywhere

Because of its big low-pressure tires, Tournatractor drives anywhere under its own power. Job-to-job moves can be made across pavement, over curbs, sidewalks, and railroad tracks. On long moves it saves time, bother, and expense of locating a trailer, moving in extra manpower and transport equipment, loading and unloading.

Reduces maintenance

Tournatractor greatly reduces maintenance and service costs by eliminating some 500 wearing parts that grind through dirt in a crawler-track assembly. Eliminated also is the friction caused by grit-grinding in the track assembly which reduces rated horsepower.

Easy to operate

With simple, easy-to-handle, power controls, and comfortable, adjustable, foam-rubber seat, operator on Tournatractor works comfortably, with less fatigue, maneuvers faster, gets more work done, in less time, with less effort.

High-speed performance

Constant-mesh transmission eliminates delays in changing gears . . . saves vital momentum . . . gives any gear-ratio instantly. As a pusher or dozer, Tournatractor high-speed reverse (up to 8 mph) is a very important time saver.

Versatility helps get more work done

Wide range of attachments increase Tournatractor range of applications, extend length of work season. Since Tournatractor is a "traveling man", these optional attachments are especially important in finding profitable jobs in a wide range of big or small industries and in any climate or area selected.

a. Equipped with Bulldozer or Angledozer blade, Tournatractor push-loads scrapers, moves short-haul dirt, cleans up at shovel, loads and spreads on dump, digs drainage ditches, maintains haul roads, clears land, terraces, digs stock piles, grades roads. Does all these jobs fast.

b. Root-Rake makes 208 hp Tournatractor a powerful tool for clearing brush, grubbing roots, raking out boulders, etc. The 11'4" wide x 4'6" high rake has 10 teeth of 4" high-grade steel, to resist shock, do heavy work.

c. Tree-pusher attached to Tournatractor, reaches high on tree with 32' forked boom, provides extra leverage to push trees down fast. Boom angle creates down-pressure on tires, increases traction, helps remove more trees in less time.

d. Tournatractor with drawbar attachments does wide variety of chores—keeps working at 100% availability. Pulls scrapers, sheepsfoot rollers, rooters, and other drawn equipment.

Ask for owner-verified job reports on work similar to yours.

Tree-pusher

Tournatractor, Angledozer, Rooter—Trademark Reg. U.S. Pat. Off. T-954-G-bw

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

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ARBA

See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

ENGINEER'S FIELD REPORT

PRODUCT RPM TRACTOR ROLLER LUBRICANT

FIRM THOS. SCALZO CO. Seattle, Washington

Just 3 new track rollers in 4 years' tough service

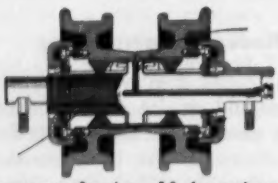
Granite Boulders put a real strain on track rollers, but this Allis-Chalmers HD20, using RPM Tractor Roller Lubricant, A/C Type, has replaced only three rollers in four years of working under such punishing conditions. Tractor is operated by Thos. Scalzo Co., specialists in earth-moving projects. RPM Tractor Roller Lubricant gives this operator an average life of 3,000 hours for track rollers on equipment in heavy-duty service. After 3,000 hours, rollers are switched to equipment in lighter duty service.

Pulling a Grid Roller, this Caterpillar D8 tractor is another of Scalzo Co.'s 14-tractor fleet—all of which use RPM Tractor Roller Lubricant. Says Vic Scalzo, "In spite of rough service under all kinds of conditions, in 15 years we have never had to replace a track roller because of lubricant failure. Our on-the-job experience and our service records prove that RPM Tractor Roller Lubricant has been doing a good job for us since we started using it in 1941."

RPM

TRADEMARK "RPM" AND DESIGN REG. U. S. PAT. OFF.

How RPM Tractor Roller Lubricants resist wear in toughest service



- Flow evenly to all bearing surfaces—retard rusting.
- Chemical agents maintain tough lubricating film and stability.
- Additive materials keep lubricant on bearings, resist leakage, helps form protective seal for bearings.
- Lubricants meet specifications of all tractor manufacturers.

For More Information about this or any other petroleum product, or the name of your nearest distributor, write or call any of the companies below.

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THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey

STANDARD OIL COMPANY OF TEXAS; El Paso
THE CALIFORNIA COMPANY, Denver 1, Colorado

MICHIGAN SCRAPER, one of three new Clark-built scrapers to be introduced at the Road Show, features complete hydraulic control of bowl and apron and a matched power train.

WORLD'S BIGGEST tractor-shovel, a 6-yd unit weighing more than 50,000 lb, loads 25-yd trucks in four passes. A 4-yd tractor-shovel and two new dozers also will be introduced.

Clark Expands Michigan Line — Introduces Three Scrapers

CLARK EQUIPMENT CO. makes its bid to join the giants of the construction equipment manufacturing industry next month when it unveils a Michigan line of self-propelled scrapers at the Road Show.

Major additions to the Michigan line of rubber-tired tractor-shovels and dozers will also be on display. And Clark promises other new developments in the near future that —together with its excavator-cranes and loggers—will make the Michigan line one of the most comprehensive in the industry.

Tractor-shovels, dozers, and scrapers feature matched power-train components that can be interchanged between units of comparable capacities.

"For the first time, three major categories of construction machinery have been engineered as a unified line of equipment," according to Clarence E. Killebrew, Clark vice president. "Equipment of corresponding capacities will utilize the same power-shift transmissions, torque converters, and planetary-wheel axles, as well as the same engines. This will result in matched horsepower and matched speeds throughout the capacity ranges of our lines.

"In addition to operating efficiencies when equipment must work in combination, the savings in spare parts inventories will be significant—up to 60% of the investment required when non-transferable parts are needed for each of the major types of equipment," Killebrew says.

The new machines incorporate the same basic matched power-train design developed by Clark for the Michigan tractor-shovel. In the 2½ yr since its introduction, more than 5,000 of these units have been sold. "And," says Killebrew, "we've never heard of a single gear failure."

Since the introduction of Michigan tractor-shovels, sales of Clark's Construction Machinery Div. have zoomed from $12 million in 1954 to over $50 million this year. Killebrew attributes most of Clark's success to the Construction Machinery Div's allotment of 4% of sales to tooling, research, and development. In 1956, $2 million was spent for these purposes.

Clark's new Michigan tractor scrapers are the 8-10½-yd model 110, the 12.7-18-yd model 210, and the 20-27-yd model 310. The units are powered with torque converter-equipped 165, 210, and 335-hp engines, respectively. The Clark-built converters—capable of multiplying torque as much as three times the engine output—work together with four-speed power-shift transmissions, and planetary-wheel axles with locking differentials to provide great versatility under all operating conditions.

The power steering system on all three scrapers includes automatic two-speed control. With this system the low steering ratio, which prevents oversteer at high travel speeds, moves into a faster-acting high ratio to provide maximum maneuverability at low speeds. Full 90-deg steering in either direction is provided. The 8-10½-yd unit will make a 180 deg turn on a 30-ft roadbed.

All scraper controls on all three units are completely hydraulic. Double-acting cylinders handle positive forward ejection and fast return, as well as providing precision control over spreading. Bowl and apron hydraulic circuits are completely independent, so that either can be lowered when the engine is stopped.

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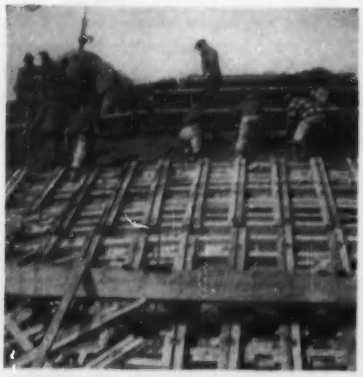
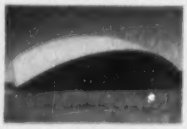


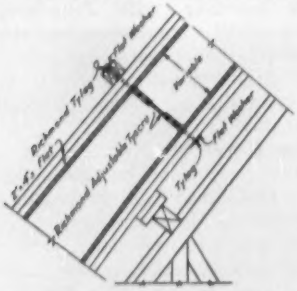
Concreting Achievement

Non-parallel forms supported by Richmond Adjustable Tyscrus

To pour the continuously curved shell of the unique MIT auditorium—it thickens from 3½" at the center to over 10" at the supports—George A. Fuller Company built an inner form on elaborate scaffolding. On the lower 25 feet of the shell, the outer forms were supported on the inner ones by Richmond Adjustable Tyscrus.



The Adjustable Tyscrus were assembled by threading a pair of standard Richmond Tyscrus — resistance welded for heavy work—on the ends of a Continuous Threaded Lagstud.



GEORGE A. FULLER COMPANY FORM DETAIL

These kept the non-parallel forms in perfect alignment while the pour was made. Assembly as well as stripping of forms was speeded by the coarse, helical-coil thread of the Tyscrus.

Send for new Richmond Handbook which tells how to pour concrete quickly and economically. It will save you time and money on your next job. Write to: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Avenue, Brooklyn 8, N. Y. or 315 So. 4th St., St. Joseph, Mo.

CLARK EXPANSION...

Continued

Scraper bowls have no obstructions to interfere with tractor-shovel loading. Sides are low to facilitate rapid loading and to increase stability when traveling. Big, wide-base low pressure tubeless tires are standard.

Big Tractor-Shovels

One of the two new Michigan tractor-shovels on display for the first time at the Road Show will be the 4-yd, 22,000-lb capacity, model 275A. The other will be the model 375A, a big 6-yd unit that is designed to provide low cost, high-speed loading of 25-yd trucks in only four passes. Both tractor-shovels feature Clark's matched power train.

The 6-yd model 375A, which weighs more than 50,000 lb, is equipped with a Cummins turbo-charged 335-hp diesel power plant. It will lift 30,000 lb while stationary and carry 15,000-lb at 4 mph.

Both of the new units offer four speeds, both forward and reverse, with a top road speed of 28 mph. Both units also feature full-power shifting through two fingertip control levers, rear wheel power steering, hydraulic boom and bucket controls, and air brakes on all four wheels. Standard tires are 26.5—25 for the 275A and 29.5—29 for the 375A.

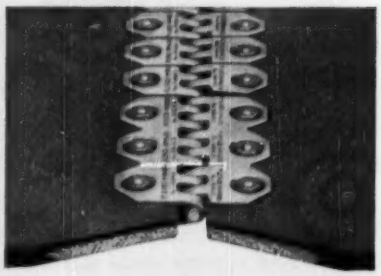
Rubber-Tired Dozers

The two new rubber-tired Michigan tractor dozers are the model 280 (a 38,000-lb unit with a 11¼-ft blade) and the model 380 (a 55,000-lb machine with a 13¼-ft blade). Power-shift transmissions, torque converters, and planetary-wheel axles are interchangeable with the 210 and 310 scraper tractors.

Heavy-duty Cummins turbo-charged engines give the two new dozers the matched horsepower they need to pushload the new scrapers. For high-speed back-up, both dozers can attain a top reverse speed of 28 mph. Top forward speed is also 28 mph.

Dozer blades on both units are hydraulically controlled. Blades can be tilted by the operator through a double-acting tilt cylinder to pry out rocks or stumps when necessary. Other features include wide-base tubeless tires, rear wheel power steering, and air brakes on all four wheels. Standard tires are 26.5—25 for the 280 and 29.5—29 for the 380.

NEW...



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★ Complete packaged joints

Standardize on FLEXCO 500X Fasteners

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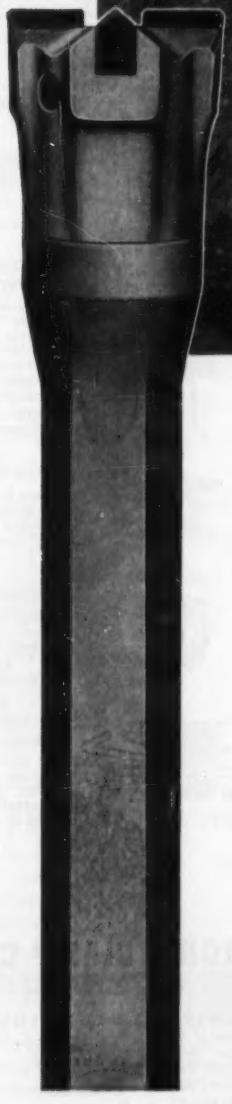
Portable Compressors

Quarry Bar Mountings



Carset Jackbits DRILL FASTER and LAST LONGER

Carsets being used with JR38A Jackdrill.

INGERSOLL-RAND Carset Jackbits, with tungsten carbide cutting edges, have demonstrated cost saving performance on rock drilling jobs all over the world.

Carset Jackbits have *deeper Carbide Inserts* for more footage between grinds—more regrinds per bit. They have *more metal behind the inserts*, providing greater support and longer bit life. *Stronger skirt walls* and *greater bearing area* on the rod shoulders enable the bit body to stand up for the full life of the carbide inserts.

These longer lasting, faster drilling Carset Jackbits, together with Ingersoll-Rand's *complete line* of rock drilling equipment, give you an unbeatable combination for overall drilling efficiency. Your nearest I-R representative will be glad to help you pick the combination best suited to your needs.

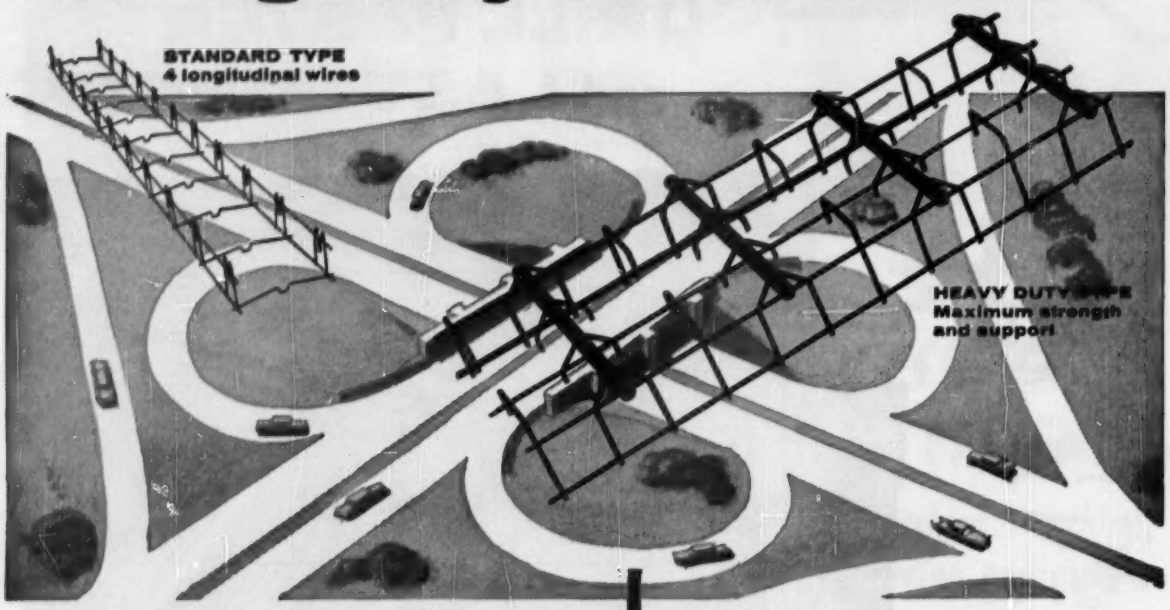
Carset Jackbits are available in gauge sizes from 1¼" to 3½".

Ingersoll-Rand 15-363

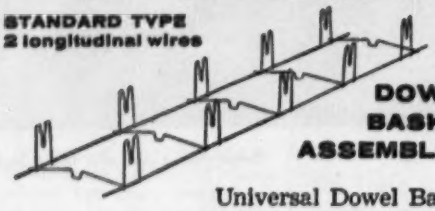
11 Broadway, New York 4, N.Y.

ROCK DRILLS • COMPRESSORS • AIR TOOLS • CENTRIFUGAL PUMPS • TURBO-BLOWERS • CONDENSERS • DIESEL AND GAS ENGINES

UNIVERSAL PRODUCTS
for highway construction



STANDARD TYPE
2 longitudinal wires



DOWEL BASKET ASSEMBLIES

Universal Dowel Basket Assemblies are designed and fabricated to specifications. Special equipment and fixtures guarantee accurate spacing and positive alignment of dowels. High speed production equipment and modern facilities insure prompt delivery of your requirements. Universal Baskets are approved by Federal, State and private authorities for highway and airport construction.

Let us quote on your requirements. Write for complete details today.

INDIVIDUAL DOWEL CHAIRS

Two-legged dowel chair holds dowel in 2 positions. Easily pushed into sub-grade—won't turn after installation. Wide range of heights.

Single Leg Dowel Chair permits quick snap-in of Dowel. Sizes to support Dowel from 3" to 6" above sub-grade.

STAKE PINS

Keep Dowel Bar Assemblies in place during the pour. Lengths from 4" to 15" in ¼" increments.

DOWEL SLEEVES

Metal Dowel Sleeves for covering ¾" Dowel Bars; overall length covers 2½" or 3" Dowel. Special sizes and lengths available.

HOOK BOLT ASSEMBLY

For providing required tying element along longitudinal joint. Eliminates necessity of bending tie bars or drilling road forms.

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GENERAL OFFICES AND FACTORY: 1238 N. KOSTNER • CHICAGO 51, ILLINOIS

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CLEVELAND, OHIO, 24901 Lakeland Blvd. • BALTIMORE, MD., 1020 N. Kresson St.
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LOS ANGELES, CALIF., 5855 South Western Ave. • ATLANTA, GA., 1401 Howell Mill Rd.
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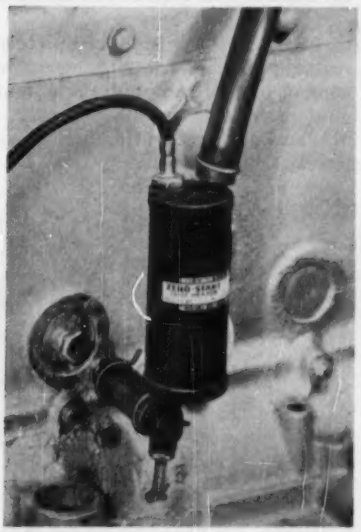
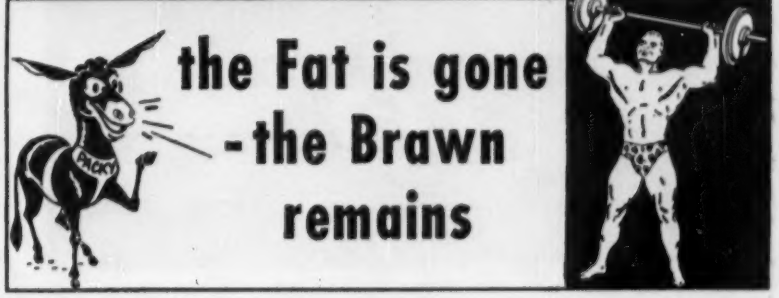


quick starts in below-zero temperatures, the unit circulates warm water throughout the entire block —and into the cab heater—in 20 seconds. A standard model for automobiles and light trucks and a heavy-duty unit for heavy equipment are available. The preheaters operate off any 115 ac/dc current supply and they are rated at 850w for the standard model and 1300w for the heavy-duty model. Suggested list price is $13.95 for the standard preheater and $18.95 for the heavy-duty unit.—**Dept KP, Phillips Mfg. Co., Inc., 2816 Aldrich Ave., S. Minneapolis, Minn.**

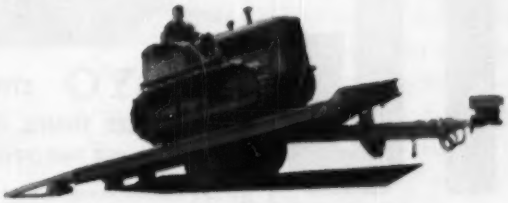
REDESIGNED DUMPCRETE — The Dumpcrete body, especially designed to haul concrete without agitation from a central mixing plant to the job site, has been redesigned for increased flexibility. The new body can now be mounted on light, single-axle trucks to handle loads up to 4 yd, or it can be used on tandem-axle trucks to handle loads up to 6 yd. Many original Dumpcrete features have been retained: a jacknife chute that swings in a 180 deg angle for pin point placement; controlled discharge of full load from 30 sec



Judicious use of alloy steel, to produce a lightweight trailer with more than adequate strength is a Rogers accomplishment in the popular LT Model.

Attractively priced, it meets the demand for more payload per pound of trailer weight.

Available in 15, 20, 25, 30 and 35 ton capacities; it is similar in general design and equipment to Rogers standard models.



*One of several Rogers *TILT-DECK Rogers trailers.*

*Trademark Registered

ROGERS
LOW BED — HEAVY DUTY
TRAILERS
ROGERS BROS. CORP. ALBION, PENNA.

Export Office: 50 CHURCH ST., NEW YORK 7, N.Y., U.S.A. *Cable Address:* Brosites

(Advertisement)

Unusual pile-driving operation within a warehouse in Tacoma, Washington, necessitated by the sinking of the structure in the fill over soft ground on which it had been built. Because of the low head room, short sections of 6-in. steel piles were welded together as they were driven, and some of the piles were driven to a depth of 60 ft. A fork lift truck was used as mounting for the pile hammer, which was a No. 7 Double-Acting Hammer manufactured by McKiernan-Terry Corporation, 110A Richards Ave., Dover, New Jersey.

There's Something

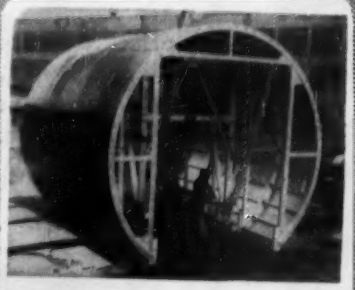
BIG

Coming From

BUCYRUS ERIE

NEXT MONTH!

196E56-e



MAYO STEEL FORMS

SPEED TUNNEL JOBS IN THE PHILIPPINES*

*5.2 Diameter Tunnel—Invert Last Ambuklao Project

Mayo produces all types of Tunnel Forms—telescopic, non-telescopic, separate sidewall and arch, single unit, full round forms for monolithic pours, etc. Each is designed for the exact requirements of the job in any part of the world—be it tunnel, sewer or conduit.

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STEEL FORMS • HEADFRAMES • MUCK BINS • SHIELDS • AIR LOCKS • LOCOMOTIVES • MINE CARS • GROUTERS

MAYO

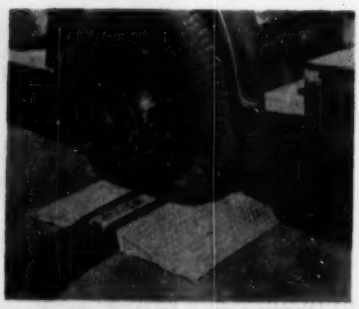
TUNNEL AND MINE EQUIPMENT

Lancaster, Penna.

EQUIPMENT NEWS . . . continued

to 30 min; all-welded completely watertight construction; variable control of the dumping angle, and one man operation.—**Mfg. Div., Maxon Construction Co., Inc., Dayton 1, Ohio.**

BIGGER PAYLOADS—The Anthony tandem-axle frameless dump trailer can carry up to 2000 lb more than conventional semi-trailers. A redistribution of weight, a simplified lifting mechanism, and the elimination of the conventional trailer frame combine to make this payload increase possible. The body serves as its own frame, and the axle is the hoist hingepoint. Called the model RL-66, the body is 21 ft long and rated at 17 yd capacity. The Anthony Teleramic hoist has a rated capacity of 25 tons.—**Anthony Co., Dept 2030, Streator, Ill.**



SAVES HOSE—Hose Ramps make a smooth roadway for traffic to pass over hose up to 4 in. in dia. The ramps are made of lightweight magnesium, rigidly supported to carry 10,000 lb, with extra-strong ramps available that will carry 40,000 lb. The standard ramp is 36 in. long, 16 in. wide, and weighs 20 lb. Ramps are held together in pairs by neoprene belting to give them flexibility on rough terrain. Diamond safety treads provide good traction under all weather conditions.—**Copperloy Corp., 4168 Brookpark Rd, Cleveland 20, Ohio.**

THIS TOO, IS JOB INSURANCE!

BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA

See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957

AMERICAN ROAD BUILDERS ASSOCIATION

SEE HYSTER EQUIPMENT AT THE CATERPILLAR TRACTOR CO. DISPLAY

Winch equipped CAT D8 tractor assists scraper through heavy mud.

A HYSTER TOWING WINCH ON MY CATERPILLAR-BUILT TRACTOR PROTECTS ME AGAINST... LOSS OF { TIME / PRODUCTION / PROFITS

• Naturally, I insure myself against all possible losses on all of my contracts. But I consider the price of my Hyster Winch the cheapest insurance premium I've ever paid.

Here's Why: Profits slide down fast when bogged-down equipment causes lost time and production. I cut this loss to a minimum by keeping the job moving with the all-purpose pulling power my Winch provides. At the same time I am reducing wear and tear on my tractor because the Winch is designed specifically for heavy pulls greater than the tractor drawbar pull.

Thousands of tractor owners have found that the Job Insurance provided by *Winch-pulling power* pays big dividends. For all the facts, call your Caterpillar Dealer (he is also your Hyster Dealer) or write Hyster Company, 2921 N. E. Clackamas St., Portland, Oregon, or 1821 N. Adams St., Peoria, Illinois.

D8D TOWING WINCH

All Hyster Winches are designed for "balanced, matched performance" with Caterpillar-built Tractors. . . . When you operate a Caterpillar-Hyster "Machine Package" you know you are getting your money's worth.

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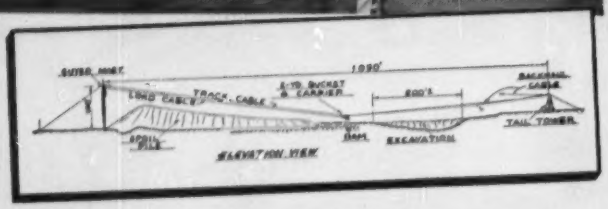
HYSTER COMPANY

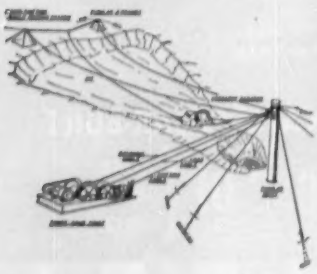
Three Sauerman Methods for Cutting Excavating and Reclamation Costs

DIGGING and CLEARING



Slackline Cableway—A 2-yd. bucket is used to maintain a clear channel to an irrigation project. The cableway digs the hard packed silt and conveys it to a spoil pile on the downstream side of the dam. Method permits removal of silt without wasting water.—*Sauerman News No. 146.*

RECLAMATION TO HOPPER



DragScraper—A 4-cu. yd. DragScraper digs sand and gravel from a wet pit and hauls it 400 ft. to grizzly hopper. This new machine handles increased plant demands in one shift. Two were required with the former installation.

—*Sauerman News No. 144.*

UNDERWATER TRENCHING

DragScraper and Crane—Here's how a DragScraper used with a carrier and track cable can extend the reach of any crane. This arrangement was highly successful in digging a trench for underwater pipe and backfilling after pipe was laid. —*Crane-DragScraper information is available in Field Report No. 228.*

Find out what the Sauerman Method can do for you

Give us details on your operation. Our engineers will give prompt recommendations and work with you to provide the best method for your requirements. Ask for Catalogs A (DragScrapers) and C (Slackline Cableways).

SAUERMAN BROS., INC. 612 SO. 28th AVE. BELLWOOD, ILL. Cable: CABEX—Bellwood, Ill

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

ANCHORING TECHNIQUES — A rundown of the latest in job-tested concrete form-tying and anchoring methods is contained in a new handbook published by Richmond. Strengths, working loads, and dimensions for Richmond form-tying and anchoring devices are included, together with drawings showing their proper use. A detailed section of form-ty engineering procedures, complete with formulas and tables, is provided also. Six pages of blueprints cover many aspects of form design and construction.—**Richmond Screw Anchor Co., Inc., 816 Liberty Ave., Brooklyn, 8, N. Y.**

WELDING INFORMATION — A handy, pocket size encyclopedia of practical welding tips will be valuable for personnel working in welding shops where the variety of metal work is non-routine. The manual covers work on aluminium, cast iron, copper and copper-bearing alloys, magnesium, nickel, steel and zinc-base die cast metals.—**All State Welding Alloys Co., Inc., 249-55 Ferris Ave., White Plains, N. Y.**

DRILL BITS — A comprehensive description of LeRoi-Cleveland one-use drill bits is provided in a recently issued bulletin. The 6-p. bulletin covers the preparation of drill rod shanks by grinding, forging, or machining; gives specifications listing the different size and color codes available for different classes and sizes of steel; and gives details of LeRoi's patented connection between bit and steel. Photographs and drawings are used to illustrate the offset gage, thinner wings, and steeper reamer angle of a one-use bit. — **LeRoi Div., Westinghouse Air Brake Co., Milwaukee 1, Wis.**

ANTHONY BODIES—A 6-p. folder featuring their new "frameless" trailer units is now available from Anthony Co. The folder contains hoist specifications, load ratings,

Two Manitowoc Cranes team up to unload intricate pump assembly at Tidewater Delaware Flying A Refinery construction site.

24 Manitowoc Cranes Help Raise Giant Tidewater Oil Refinery

A total of 24 Manitowoc Cranes is working on the erection of the huge new Tidewater Oil Company Delaware Flying A Refinery near Delaware City, Del. Covering 5000 acres, the ultra-modern refinery will be the biggest built at one time as a single unit, with an expected throughput of 130,000 barrels of oil per day.

C. F. Braun and Co., Alhambra, Calif., designers and engineers for the project, is also handling actual construction of the refinery. The Braun Co. is using 22 Manitowoc crawler cranes, and two Manitowoc Mobile Cranes, units ranging in capacity from 40 to 80 tons, with booms 60 to 120 feet long.

A tremendous variety of jobs are handled by the Manitowocs. Some of the work includes: unloading freight cars, stacking incoming materials, transporting machinery to the construction site, pouring concrete, erecting scaffolding and rigging poles, setting steel, erecting 250 miles of elevated pipeline, laying underground conduits and setting high velocity water pumps on foundations.

Machine downtime on the Tidewater project has been negligible, with no holdup of work due to breakdowns . . . a real testimonial to the ruggedness and solid engineering for which Manitowoc cranes are famous!

Your Manitowoc Distributor will be glad to supply all the details on Manitowoc's versatile line of cranes and excavators — call him today!

MANITOWOC ENGINEERING CORP.,
MANITOWOC, WIS.

What the Men on the Job Think of Their Manitowocs!

"For steel erection you can't beat Manitowoc. One of the finest machines on the market."
Don Rossillo, Crane Operator

"The 2800 is the best motor crane on rubber that was ever made. It will pick up 20 tons without an outrigger and walk away with it."
Jack Streets, Ironworker's Foreman

"For hooking rigs, setting steel, or pouring concrete, Manitowocs can't be beat. And they stand up very well. Been working here an 8 hour day, 5 day week for about ten months and have never been down a minute for repairs."
R. L. Slater, Operator

"This mobile model 2800 is one of the best cranes for all-purpose work. They are strong and smooth running, both on the hoisting and the travelling on the road. Best machine I ever ran, truck or cat."
Prince A. Congleton, Operator

"Sturdiest truck crane on the market, and I've run them all."
Harry Racine, Operator

MANITOWOC
SHOVELS 1-5½ YD. Speedcrane CRANES 20-100 TON

The Bethlehem shop-fabricated bar mats are made up of nine No. 5 bars and seven No. 3 bars.

Continuous Reinforcement

IN 2-MILE STRETCH OF HIGHWAY NEAR YORK, PA.

During the relocating of sections of U. S. Route 111, between Harrisburg and York, Pa., it was decided to pave a two-mile stretch using continuous reinforcement instead of transverse contraction and expansion joints and standard reinforcement.

This longest stretch of continuously reinforced highway in Pennsylvania is four lanes wide, with a 20-ft medial strip. Each lane is 12 ft wide. A 9-in. slab was laid.

No transverse joints were used. Instead, special mats of deformed bars were laid to form the continuous steel reinforcement. The mats, which were furnished by Bethlehem, had a weight of approximately 181 lb per 100 sq ft and were placed at the midpoint after the first course of concrete had been struck off, just as ordinary mats are placed in reinforced-concrete paving, without any necessity for accessories.

H. J. Williams Company, of York, Pa., laid the continuous steel reinforcement and paved this two-mile stretch of Route 111.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

LAYKOLD Weathercoat

–a "permanent poncho" for exposed insulation

If you have "hot" or "cold" tanks, towers, vessels or piping exposed to the weather, you know the problem. Insulation must be kept *dry* to be effective. Weathercoat is the answer.

High-efficiency insulation insurance

Laykold Weathercoat is the best "raincoat" your units could have because it seals out not only water but also water vapor. In addition, Weathercoat stays "alive" through season after season.

Write for full details.

AMERICAN Bitumuls & Asphalt COMPANY

200 BUSH STREET
SAN FRANCISCO 20, CALIFORNIA

NEW PUBLICATIONS . . .
Continued

and construction details of single-axle and tandem-axle units. One section describes the ease with which the huge semi-trailers can be operated.—**Anthony Co., Dept. 194, Streator, Ill.**

SOIL TESTING EQUIPMENT—Soiltest's new 128-p. catalog contains descriptions and illustrations of over 1,200 items used for testing soil, concrete asphalt, and other materials. Included are suggestions for laying out a testing laboratory for basic sampling and plans for a mobile laboratory are also provided. A special section is devoted to equipment for testing concrete. —**Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill.**

GALION GRADER—The advantages of torque converter drive and power shift transmission in the Model T-600 Grade-O-Matic grader are discussed in a new booklet. Features of design and construction, general specifications, and available attachments for the 140-hp, 30,420-lb grader are included.—**The Galion Iron Works & Mfg. Co., Galion, O.**

LINK-BELT LINE—A new 8-p., two-color catalog covers the complete line of Link-Belt Speeder shovel-cranes. Units described include 18 crawler mounted models ranging from ½ to 3-yd capacities; five truck-cranes with capacities from 12½ to 35 tons; and four rubber tired models with capacities from 15 to 35 tons.—**Link-Belt Speeder Corp., Cedar Rapids, Iowa.**

PIPE PROTECTION—Techniques for protecting underground pipe from corrosion with Scotchrap brand pipe insulation tape are discussed in a new 24-p booklet called "Tape It Easy." The booklet provides step-by-step instructions, illustrated with photos, for wrapping bends, elbows, and short sections; patching pipe with tape; preparing joint surfaces for wrapping; wrapping welded joints; and taping straight pipe sections as well as street T-fixtures. A table on the book's back cover lists recommended tape widths for various pipe sizes, and outlines the minimum recommended tape overlap and the number of squares of tape needed per 100-ft of pipe.—**Minnesota Mining and Mfg. Co., Dept D6-262, 900 Fauquier St., St. Paul, Minn.**

WAREHOUSE GOING UP...

Contractor: John Cassidy Construction Co., Memphis, Tenn., and Paducah, Ky.
General Superintendent: Bill Barron
Forming: Gates Panel System

. . . Costs staying down with Gates

Warehouse construction drives home the many ways Gates Forming Systems save time and money on every job. For instance, use of a Gates Forming System on this 4' deep x 320' long spandrel beam paid off in definite, *measurable* savings.

One brace was used every eight feet on one side *only*...a savings of 75% of the bracing normally required for a spandrel beam. Labor costs were reduced 25%.

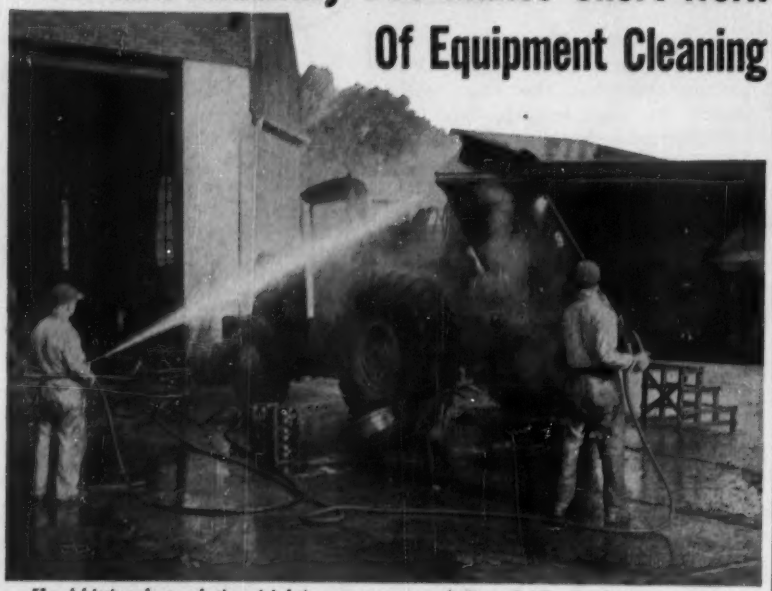
Gates Systems are efficient, versatile, uniform and practical...thoroughly researched and job-tested for better construction. Across the country, more and more jobs are getting done *better, faster* thanks to the speed and efficiency of Gates Systems.

Their benefits to architect, contractor and owner are many and great, and warrant consideration. For facts about other Gates System applications, large or small, contact your Gates Dealer. Remember, in commercial construction as well as residential, Gates Builds the Best... Better!

CME 12/56

Gates & Sons, Inc.
80 S. Galapago St., Denver 23, Colorado

Two-Gun Malsbary 300 Makes Short Work Of Equipment Cleaning



Hard-hitting hot solution (right) cuts grease and dirt off "Euc" while man at left cold-rinses cab. Note effective, jet-like streams—no billowing, no work-hiding fog. For indoor-outdoor use, Savin locates Malsbary 300 just inside shop.

To keep 222 pieces of heavy equipment rolling, Savin Construction Company, East Hartford, Conn., works a tight maintenance schedule. Its fast timetable depends on a two-gun Malsbary 300 HPC (high pressure combination) cleaner. This lets two men work hot solution and cold rinse simultaneously to clean and degrease on-the-double. Says Supt. Ira Davidson:

"With this enormous investment to protect, our Malsbary has paid for itself many times over. In winter, equipment is covered with ice, frozen mud, hard grease and grime—pretty tough to get off but the 300 does a dandy job... enables us to set up a schedule with little downtime."

4 Years without Trouble

"We use our Malsbary 300 from 7 a.m. 'til 5 or 6 at night... bought it 4 years ago and have had no maintenance trouble at all with it. It requires no attention other than starting and stopping and setting up the hot solution mix. Also, it's nice to know replacement parts, if needed, can be procured immediately." (Malsbary has over 175 Authorized Service Centers conveniently located.)

Only Malsbary 300 and 500 Series cleaners deliver high pressure hot solution and high pressure cold water rinse simultaneously for heavy work loads.

Keep your equipment on the job

Why let cleaning slowdowns balloon your in-shop time? The right size cleaner for your work load is the cheapest cleaner for you to buy. Ask your Malsbary dealer which model will do the most efficient, economical job for you. Have him demonstrate it on your job NOW, or write today for free catalog.

Brown County, Wis., Highway Dept. cleans tractor treads, other equipment, with mobile Malsbary 250 HPC.

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MALSBARY

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On Route 4, north of Sleepy Eye, Minn., Berghuis Construction Co.'s Adams 550 grades fill in 3rd gear (4.5 mph).

When traffic over a narrow, hump-backed 17-mi. section of Minnesota State Route 4 — from Fairfax to Sleepy Eye, Minn. — grew too heavy for safety, the State Highway Dept. decided to rebuild it. Berghuis Construction Co., Prinsburg, was awarded the earthmoving contract. The roadway was to be widened, ditched, and regraded to make driving safer, and to permit heavy commercial traffic.

Berghuis split the 465,000-cu. yd. dirtmoving job between two work groups. Three crawler-drawn 19-yd. LeTourneau-Westinghouse 8T scrapers worked ahead, cut down high shoulders and cleaned drainage ditches. Then two 23-yd. 8 Tournapulls and three 16-yd. "C's", push-loaded by 2 crawlers, hauled sandy-clay fill to build new grade. (Current models have 25 and 18-yd. capacities.) Tractor-pulled LeTourneau-Westinghouse 120 and W-2 sheepsfoot rollers compacted the fill. Three motor-graders handled the grading (50% was done by an Adams 550). A rubber-tired Tournatractor and a crawler were assigned miscellaneous dozing, casting, and finishing jobs. Work was completed in the scheduled 120 working days.

Mobility and speed of heavy-duty grader boosts Berghuis fleet production

Berghuis Construction Co., Prinsburg, Minnesota, helps speed dirtmoving, and keep all units of its production "team" working at top capacity with a versatile Adams 550 motor grader. On a 17-mile highway contract—improving Minnesota Route 4—Berghuis used "550's" 8th-gear-speed of 25 mph to move the machine quickly from one job to another... whenever and wherever needed. This Adams grader spread fill behind self-propelled scrapers, leveled the new road surface, formed shoulders, and cut ditches and bankslopes. It kept 600′ to 800′ haul-roads smooth for Tournapull scrapers traveling at 16 mph on 3 minute cycles.

Owner Delwin J. Berghuis, happy with the performance of his "550" . . . says, "I like the speed and maneuverability of the Adams, and feel that it has done a great job for us. On the Route 4 project it helped put us ahead of schedule."

8 forward, 3 creeper, 4 reverse speeds get more work done, faster, at lower cost

On the Adams 550, constant-mesh transmission provides a range of 8 standard speeds forward, from 1.4 to 25.2 mph. With 4 standard working speeds under 6.5 mph, you blade, ditch, mix, and bank cut at time-saving production speeds. Lighter work, including off-season contract snow-plowing, is done in 5th and 6th. The two top gears — with speeds to 16.1 and 25.2 mph — cut travel time between chores, speed grader job-to-job.

Three optional creeper gears — 0.25 to 1.76 mph — afford very slow speeds for fine-grading and close-quarter maneuvers. They give you smooth control and extra power to rip hard-packed roads and old asphalt. Creepers also reduce heavy shock loads in working through rocks and roots, eliminate "slipping the clutch".

Four reverse gears offer speeds to 13.2 mph for reverse blading and ditching as well as fast back-up. With this wide range of reverse gears you get more work done and reduce non-productive shuttle time.

Call or write for a demonstration. See for yourself how Adams graders handle heavy work easier, faster than any grader you've ever used!

New POWER-Flow 660...190 hp
with torque converter...30,200 lbs.
Model 660...150 hp...30,050 lbs.
Model 550...123 hp...26,370 lbs.
Model 440...104 hp...24,080 lbs.
Model 330... 80 hp...23,020 lbs.
Model 220... 60 hp...15,500 lbs.
(Weights shown are usual working weights)

TraveLoader — Self-propelled, belt-type loader for picking up and loading into trucks from windrows and stockpiles. Choice of 55 hp gasoline or 60 hp diesel engine; 16,800 lbs.

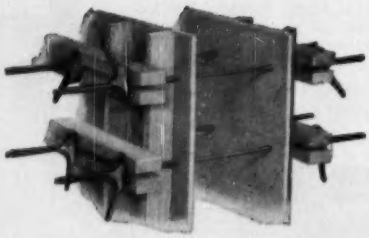
Adams, POWER-Flow—Trademark, Tournapull, Tournatractor—Trademark Reg. U.S. Pat. Off. AG-31-H-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS
A Subsidiary of Westinghouse Air Brake Company

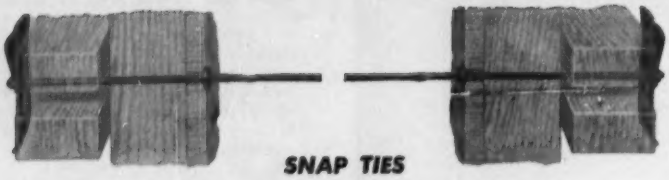
ARBA See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

SUPERIOR

All the Accessories For Dependable Concrete Forming!



TILT LOCK CLAMPS



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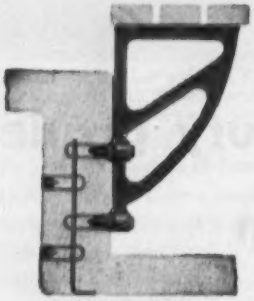
STANDARD COIL TIES



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PANEL LOCK BOLTS

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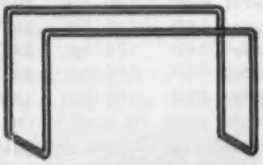
"PICK-UP" INSERTS FOR TILT-UP SLABS

SPECIAL HANGER FRAMES



WIRE BEAM SADDLES

Shown here are some of the many types of Form Ties, Anchors, and other concrete accessories which SUPERIOR'S years of engineering and field experience plus manufacturing dependability have developed and produced.

Every item in the SUPERIOR line is specifically designed to provide the most dependable and efficient forming method for ordinary foundations, engineering structures, watertight walls and architectural concrete.

When you plan form work, SUPERIOR'S experienced engineers are available to prepare suggested layouts of form work as well as complete estimates and quotations.

For details request copy of our COMPLETE CATALOG

SUPERIOR CONCRETE ACCESSORIES, INC.

4110 Wrightwood Avenue, Chicago 39, Illinois

New York Office: 1775 Broadway, New York 19, N.Y.

Pacific Coast Plant: 2100 Williams St., San Leandro, Calif.

COMMENT
from the
BUTLER ENGINEER

Of Expansion and a Secret

You know, in a manner of speaking we are operating a store here at Butler Bin.

We don't have merchandise on shelves but our stock in trade is engineering knowledge and long, long experience. Try dealing with our store. I think the quality will become evident.

Incidentally we've expanded the floor space in our engineering store so we're ready. We've greatly enlarged the fabricating area . . . and for good measure we're putting in a new and larger scale department.

Just by the way of evidence of the fantastic growth in the Ready Mix industry we're designing a Ready Mix Plant that will be completely and automatically controlled by TWO punched card batchers. Who could have dreamed of such production—say ten—no even five years ago.

One gets wondering where all the incredible volume of concrete goes. But stop and think. Sure, there's a lot of big building construction—and the highway program eats up concrete with a ravenous appetite. But how do you account for the enormous number of Ready Mix Plants even in very small communities. That, gentlemen, is where a perfectly huge volume goes. It's the home-owner who decides to put in a concrete driveway . . . a walk to his front door . . . the new subdivisions.

Ask yourself how much concrete you have in your own yard. OK? Now multiply that by millions!

You've never seen anything like the equipment Butler Bin is exhibiting at the Road Show. Can't tell you about it now—but make a note!

See you — where?
Road Show, of course

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

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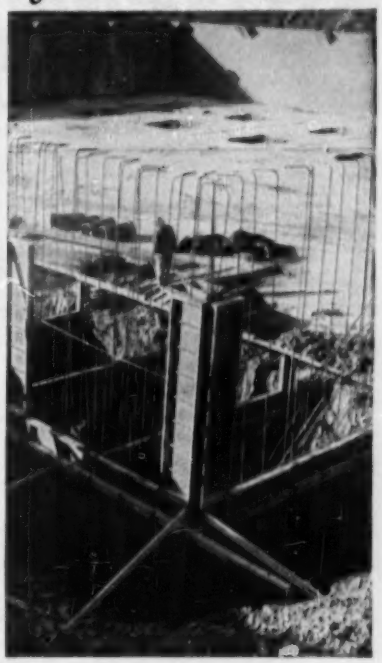
Buy and use Christmas Seals . . .

Fight Tuberculosis!

Symons FIELD REPORT...



Contractor Saves 40% with Symons Forms . . .

7,500 square feet of Symons Standard Forms were used in the new 2 million gallon capacity pumping station at Melrose Park, Illinois. 2,000 cubic yards of concrete were used on the job and the concrete contractor, Louis Macro Company, Melrose Park, reported a 40 per cent saving through the use of Symons Forms. Walls for the job were completed in three pours.

Symons engineering service can help you realize substantial savings in forming. With your plans, our engineers will prepare a complete form layout, bill of materials, and make recommendations for the most efficient and cost saving method of forming.

Our field service representatives are sales engineers, ready and able to advise you on form erection, pouring and stripping methods that will help you save time, labor and materials. You can call on them to assist you on any forming problems.

Symons Forms can be rented with purchase option. Symons Clamp & Mfg. Co., 4255 Diversey Avenue, Dept. M-6, Chicago 39, Illinois.

Sam Carniglia Company, Melrose Park, Illinois
General Contractor.

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FORMS—CLAMPS—SHORES
Sent on Request

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(Classified Advertising)

EMPLOYMENT BUSINESS **"OPPORTUNITIES"** EQUIPMENT USED OR RESALE

UNDISPLAYED —RATES— DISPLAYED

$1.80 per line, minimum 3 lines. To figure advance payment count 5 average words as a line. Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Positions Wanted undisplayed advertising rate is one-half of above rate payable in advance.

Box Numbers—count as one line.

The advertising rate is $18.90 per inch for Equipment & Business Opportunity advertising appearing on other than a contract basis. Contract rates quoted on request.

Employment Opportunities—$26.60 per inch, subject to Agency commission.

An advertising inch is measured ⅞" vertically on one column, 3 columns—30 inches—to a page.

Send New Advertisements and inquiries to Classified Adv. Div. CONSTRUCTION METHODS & EQUIPMENT, P. O. Box 12, N.Y. 36, N.Y.

When You Need
LOW COST—DEPENDABLE
INDUSTRIAL RUBBER PRODUCTS

call CARLYLE

FOR ALL YOUR REQUIREMENTS OF

RUBBER HOSE

Air, Acid, Paint Spray — Solvent Welding, Pile Drive — Discharge Fire, Fuel Oil — Oil Suction & Discharge, Gasoline — Suction Water, Steam — Vacuum Pneumatic, Road Builders

RUBBER BELTING

Conveyor Elevator — Grader Chute Lining — Hot Material Mucker — V-Belts Transmission

PROMPT SHIPMENTS LOW COST QUALITY PRODUCTS

CARLYLE RUBBER CO., INC.
103-107 Warren St., New York 7, N. Y. Digby 9-3810

RENT STEEL SHEET PILING

Get the exact lengths and sections you need of all standard sections, delivered *on time*—and at Foster's low low rental rates.

H-BEARING PILE
PIPE FOR PILING
LIGHT-WEIGHT STEEL PILING
PILE HAMMERS & EXTRACTORS

L.B. FOSTER CO.

PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
ATLANTA 8 • HOUSTON 2 • LOS ANGELES 5

SALES REPRESENTATIVE

Leading manufacturer of asphalt plants has opening on east coast for hard-hitting Sales Representative. Prefer salesman with prior asphalt plant experience. Dealer organization long established. Salary, travelling expenses and bonus arrangement. Good opportunity with one of oldest manufacturers. Reply RW-3450

CONSTRUCTION METHODS AND EQUIPMENT
Class. Adv. Div. P.O. Box 12, N.Y. 36, N.Y.

"SEARCHLIGHT" Can Help You!

Hundreds of miscellaneous business problems that confront you from time to time, can be solved through the use of the SEARCHLIGHT SECTION of CONSTRUCTION METHODS AND EQUIPMENT.

When you want to buy or sell used or surplus new Construction equipment and/or accessories, or have other business wants — advertise them in the SEARCHLIGHT SECTION for quick, profitable results!

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CHICAGO: 520 N. Michigan Ave. (11)
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EMPLOYMENT

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Junior Construction Cost Engineer. Some knowledge of estimating desirable. Excellent opportunity with long established international company. Location New York City. P-3351, Construction Methods, P. O. Box 12, New York 36, N. Y.

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AUSTIN-WESTERN HYDRAULIC CRANE

a great Contractor Tool *says John G. Yerington*

"Our hydraulic crane is a service unit which, therefore, should be available at all hours, to lower the downtime on more expensive equipment and save the time of our own and our copartners' gangs of men on a job."

"One of the commoner services our hydraulic crane is called upon to perform is changing wheels and heavy tires on other equipment. The 16.00x20 tire on a grader carrying 1½ barrels of water for weight used to be changed by 3 or 4 men by main force and ignorance. Now with the hydraulic crane 2 men make the change in a fraction of the time."

"We maintain 4 storage yards, and since they are not served by overhead cranes, our hydraulic unit is especially valuable there."

"In handling the Benton Harbor airport contract, we laid ¾ of a mile of 24" corrugated metal and reinforced concrete pipe with great success. Our Austin-Western hydraulic unit is so accurate that we can lower pipe ¼" or ⅛" at a time for better and faster pipe fitting. It is easy to handle mixed concrete to the second or third story of a building."

"Our Austin-Western hydraulic crane has the mobility that enables it to go practically anywhere and be of service in dozens of different ways. Its large 14.00x20 tires and their good grip on the ground make it possible to go through sand or wet or loose soil where many other kinds of equipment would have trouble. Four hydraulic stabilizers allow a wide boom swing."

For the complete Yerington story, ask for Gould Certified Report No. 5605.

AUSTIN-WESTERN WORKS
BALDWIN-LIMA-HAMILTON
Construction Equipment Division
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AUSTIN-WESTERN WORKS
607 Farnsworth Avenue, Aurora, Illinois
Please send complete Gould Certified Report No. 5605.

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Company _____

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Methods Memo . . .

Tunnel Job a la TV

This time construction men form the sidewalk superintendent brigade as they watch a television crew "push" a heading through the hills behind Hollywood. Actually, the tunnel was already there —part of an abandoned stone quarry—but after the television crew got through it, the set looked a lot like the real thing.

The television cameras were filming this scene for a show that will be given by Telephone Time Dec. 30 over the CBS network.

To make things as realistic as possible, CBS borrowed more than $250,000 worth of tunneling equipment from the G. E. Kerns Construction Co. of nearby Long Beach, Calif. Several of Kerns' personnel were also pressed into service as technical advisers.

The true story concerns an incident in the career of B. A. Peters, who was superintendent for the Crafe-Calahan Construction Co. of Dallas and the Rhoades-Shofner Construction Co. of Los Angeles.

Called "The Mountain That Moved," the story deals with a subterranean slide in 1950 that blocked an irrigation tunnel running through a mountain dividing the Colorado River and Colorado's Grand Valley.

In a race against drought, Peters and his crew were given the job of pushing a 2,250-ft heading through the mountain in 2½ mo. If they could not hole through in time, farmers in the area who depended on the water of the Colorado River would be wiped out.

Where rock had been expected Peters found earth, and the extra shoring that was required made the going slow. On top of this, the farmers told him that the tunneling schedule would have to be cut in half if they were to get water in time.

With his own career at stake, and with his firm's profit on the job melting away, Peters brought in more men and equipment and worked around the clock. By averaging 72 ft a day, he holed through in plenty of time.

Progress on Seaway

"Several St. Lawrence Seaway contracts have been completed recently, and the emphasis has now changed from excavation to the erection of structures," according to Lionel Chevrier, president of the St. Lawrence Seaway Authority.

More than 30,000,000 yd of excavation, 46% of the total, is completed and more than 60% of the 9,000,000 yd of dike construction is now in place. About 250,000 yd of concrete, or 15% of the total, already has been placed, Chevrier said.

More than $178,000,000 in contracts have been awarded. Among the few major contracts still to be let are dredging contracts for the approaches to the Iroquois canal and lock and for deepening the Welland ship canal.

The Biggest Show on Earth

ARBA manufacturers will spend more than $8 million to stage the Jan. 28-Feb. 2 Road Show at Chicago's gigantic International Amphitheatre. Already the biggest exhibit hall in the country, the Amphitheatre is being enlarged to accommodate the biggest display of construction equipment ever assembled. The display will cover some 585,000 sq ft—about the size of 12 football fields.

Almost all of the 250 manufacturers at the show—the first in 9 yr—will introduce new equipment models. The show is expected to attract the largest crowd of construction men ever assembled. Besides being the biggest and the most expensive, the show will also be the fanciest: Sidewall and ceiling decorations alone will cost $100,000.

School for Operators

A school to teach the operation and maintenance of earthmoving equipment to beginners opened its doors last month on a 600-acre tract near Joliet, Ill.

Operated by the Greer Technical Institute of Chicago, the school offers three courses: 200 hr on crawler tractors, 160 hr on motor graders, and 320 hr on a variety of earthmoving equipment.

A full line of International Harvester equipment, including crawlers, loaders, off-highway trucks, and scrapers, is available for field training. Five instructors with a total of 50 yr of construction experience will conduct the training.

THE TRADE MARK THAT COMES TO LIFE . . .

. . . to serve you with products that aid in obtaining, more economically, the qualities you want in concrete.

Our half century of experience is promptly available for:

1. product-selection consultation
2. product-use service on the job . . . through the 43 branch offices shown here staffed by more than 100 Master Builders skilled fieldmen.

If you are associated with concrete in any way, you will benefit by calling in one of these men.

THE MASTER BUILDERS COMPANY

Division of American-Marietta Company

CLEVELAND 3, OHIO • TORONTO 9, ONTARIO

POZZOLITH • MASTERPLATE • EMBECO and other products for the improvement of concrete and mortar.

Has power to push the biggest loads –has TIMKEN® bearings to take 'em

RADIAL and thrust loads on vital moving parts are tremendous in this 40,125 lb. Galion Motor Grader, the world's biggest, as it pushes tons of earth at a clip. To take the heavy loads and keep the giant machine working smoothly and steadily, Galion Iron Works engineers specified Timken® tapered roller bearings for the front wheels, steering gear, circle reverse case, side shift case, tandem drive case and final drive.

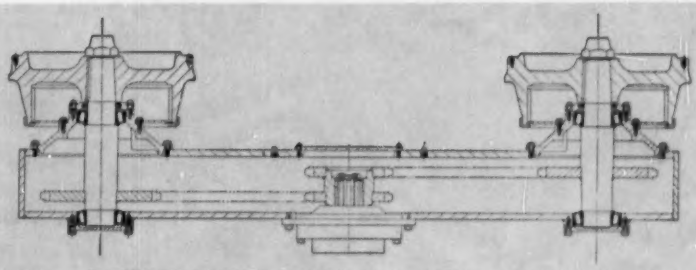
Timken bearings take radial and thrust loads in any combination. It's the tapered construction that does it. And full line contact between rollers and races gives Timken bearings *extra* load-carrying capacity. Shafts are held in rigid alignment. Gears mesh smoothly. Shafts and housings stay concentric making closures more effective. The machine keeps on the go with less wear, less maintenance.

Timken bearings take the shocks of rutted, uneven ground, too. That's because Timken bearing rollers and races have tough, shock-resistant cores under hard, wear-resistant surfaces. Longer bearing and machine life are assured.

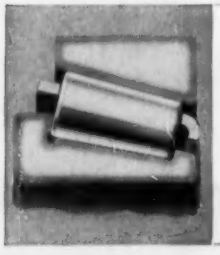
Timken bearings roll the heavy load smoothly—don't slide it. They practically eliminate friction. Timken bearings are designed by geometrical law to have true rolling motion and manufactured with microscopic accuracy to conform to their design.

Only Timken bearings give you so many advantages. Make sure you get them; always specify Timken bearings for the machines you design, buy or build. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **GALION IRON WORKS & MFG. CO.**, Galion, Ohio, uses Timken bearings in the tandem rear wheels of T-700 Motor Grader to take heavy loads, reduce friction, assure trouble-free, dependable performance.



GREATER LOAD AREA

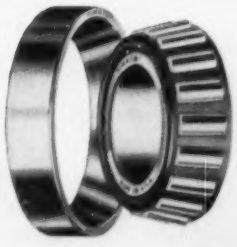
Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer.

Only Timken tapered roller bearings have these advantages: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. Timken fine alloy steels.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ▯ AND THRUST—▯— LOADS OR ANY COMBINATION—✳